

DISTRO

080213 #101

engadget

**NVIDIA'S
VERSATILE,
PORTABLE
SHIELD**

**THE RETURN
OF GOOGLE'S
NEXUS 7**

**HISENSE'S
\$150 SERO 7
PRO SLATE**



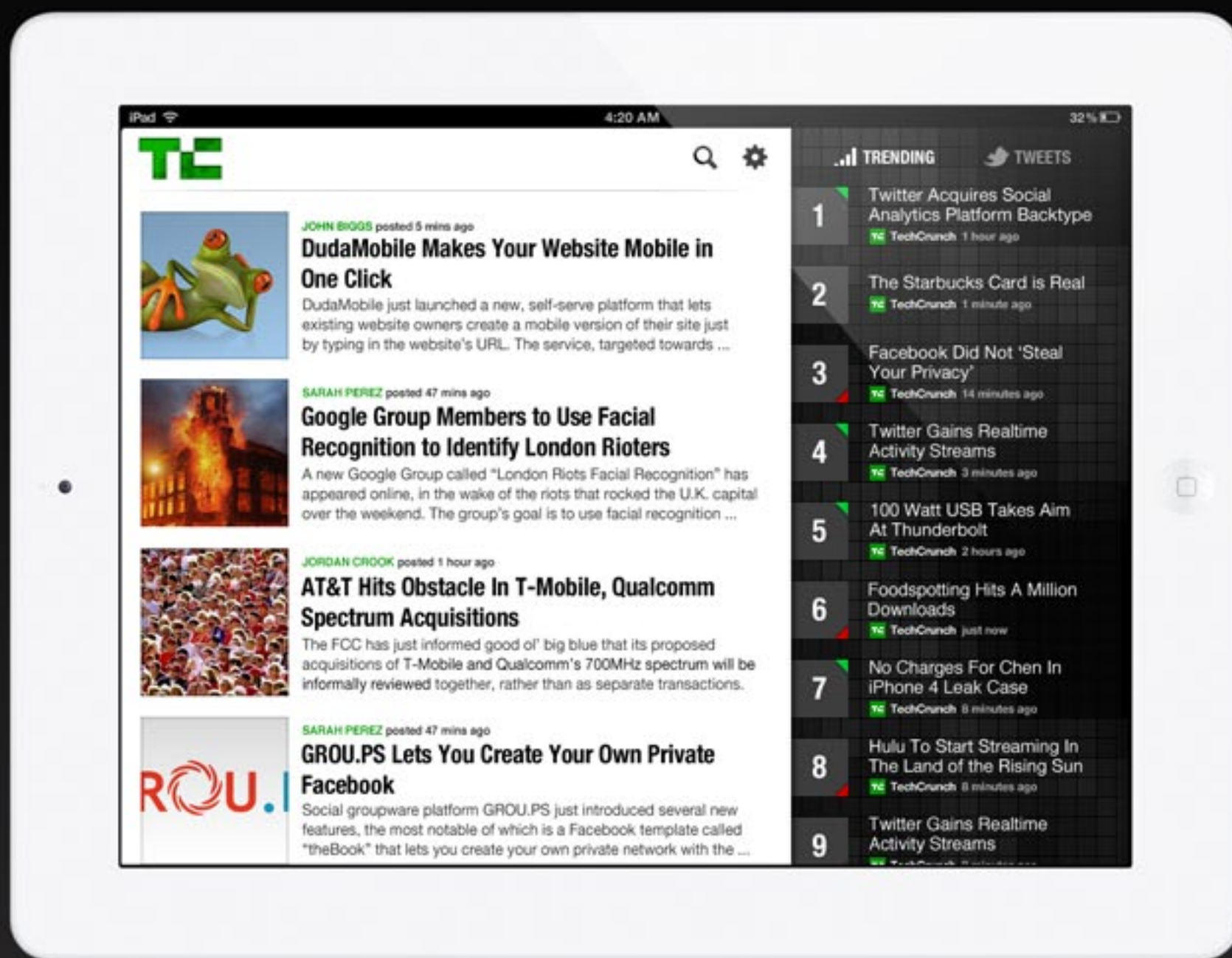
Q Who?

**GOOGLE TAKES ANOTHER STAB
AT STREAMING WITH A DIMINUTIVE DONGLE
AND A PRICE TO MATCH**



TechCrunch

The Inside Story On Innovation.



Now available for your iPad.



Brought to You by AOL | Free Download in the App Store



Available on the
App Store

ISSUE 101

DISTRO

08.02.13

TABLE OF CONTENTS

ENTER

EL

**EDITOR'S
LETTER**

**Made in the
USA... Sort Of**
By Marc Pertont

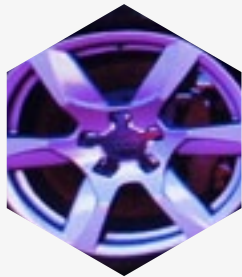
IN

INBOX

**Nexus Logjams,
Mini Misnomers
and Social
Downers**



EYES-ON
**Razer
Atrox**



HANDS-ON
**SIGGRAPH
2013**

WS

WEEKLY STAT
**Billion Dolla'
Dolla' Bills
Y'all: Earnings
are Back**
By Christopher
Trout

RR

REC READING
**Confessions of
a Google Glass
Explorer**
By Donald
Melanson

FORUM

SO MW

SWITCHED ON

The Camera Phone
By Ross Rubin

MODEM WORLD

**The Sinister Side
of the '80s BBS**
By Joshua Fruhlinger

REVIEWS

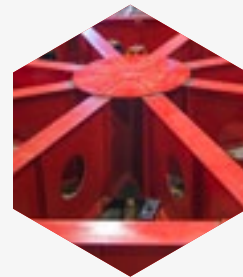
**Hisense
Sero 7 Pro**
By Melissa
Grey

**Google
Nexus 7**
By Brad
Molen

**NVIDIA
Shield**
By Ben
Gilbert

**Google
Chromecast**
By Michael
Gorman

ESC



VISUALIZED
**The Big
Move**



Q&A
**OUYA Founder
and CEO Julie
Uhrman**

IRL

IRL

**TYLT Energi Charging
Backpack and
Logitech FabricSkin
Keyboard Folio**



REHASHED
**Air Streaming,
Clicker Finding
and Warm
Fuzzing**

TM

TIME MACHINES
Clean Sweep

On the Cover:
Photo by
Will Lipman for Distro



MADE IN THE USA... SORT OF

DISTRO
08.02.13

EDITOR'S
LETTER



Motorola has been doing its best to build some buzz around the Moto X, which launched this week. As a smartphone, the X is decidedly middle-of-the-road. It boasts specs and a design similar to the Droid models Motorola announced last week. Available later this month at \$199 on-contract from most major US carriers, the X's biggest claim to fame — other than swappable backplates, including one made of wood — is the fact that it's assembled in the US, in a 500,000-square-foot factory in Fort Worth, Texas. Yes, that's "assembled." Despite widespread reports that the X is being made in the US, most of its components, from its display to those backplates, are produced in factories around the world, and workers in Texas will assemble the phones.

Does it really matter where your smartphone is made? If your main concern is domestic job creation, it might. A 2012 survey by Boston Consulting Group found that over 80 percent of Americans are willing to pay more for products that are made in the US instead of China, mainly because they want to keep jobs in the country. Interestingly, the same

survey found that 60 percent of Chinese consumers would pay a premium for US-made products, apparently based on the belief that the US produces higher-quality products. When it comes to smartphones, that's an idea that's difficult to put to the test; there are none currently manufactured in the United States, and that's not about to change with the launch of the X.

For those looking for a truly "Made in the USA" smartphone experience, however, there is one place to look: operating systems. As pointed out in a recent report from Kleiner Perkins Caufield & Byers, US-developed mobile OSes — iOS, Android, Windows Phone — now power 88 percent of smartphones. That's up from just 5 percent six years ago, when the dominant players were Finland's Nokia and Canada's RIM.

In this week's Distro, Ben Gilbert reviews the NVIDIA Shield, which he declares a "truly strange device." At Engadget, we see more than our share of unusual gadgets, so for us to declare something "strange," it had better be seriously bizarre. Or at least a clever reinvention that subverts conventional norms and forces you to rethink how you interact with technology.




“The Chromecast may be the anti-Nexus Q; the simple, small media streamer puts Netflix and pretty much anything you can load in a browser on your TV for just \$35.”

The Shield, which looks like (and, basically, is) a gaming controller merged with an Android tablet, fits solidly in the latter camp. It lets you stream games from your PC to its 5-inch screen. It runs Android games. And it's a fast, sturdy Android tablet, making it a handy choice for streaming media on the go. As Ben puts it, the Shield is an “an excellent tablet replacement” and worth considering for “hardcore PC gamers and Netflix junkies alike.”

This week, we also took closer looks at Google's latest launches, the Chromecast and the second-gen Nexus 7 tablet. Not surprisingly, given its heritage, Brad Molen found that the \$230 Nexus 7 provides the “best bang for the buck” among small tablets, thanks to its “simply beautiful” display and solid per-

formance. The Chromecast may be the anti-Nexus Q; the simple, small media streamer puts Netflix and pretty much anything you can load in a browser on your TV for just \$35. Michael Gorman calls it a “bona fide steal.” Not surprisingly, it's sold out at retail and there's a three- to four-week wait in the Google Play store.

One product you won't have to get on a waiting list to buy is the Wii U, which continues to gather dust on store shelves around the world. Nintendo's latest quarterly earnings report shows sales of just 160,000 Wii U consoles in the most recent quarter. That's world-wide. During the same period, Microsoft sold about a million Xbox 360s. The Wii U was even smoked by the original Wii — at least in relative terms. Nintendo sold 210,000 of the older model this quarter.

Speaking of console sales, after initially selling out on Amazon and GameStop, the \$99 OUYA console is now more widely available. While OUYA doesn't disclose sales figures, CEO Julie Uhrman recently commented that, after the early sellouts, the company is “still chasing demand.” Don't miss Uhrman's answers to the Engadget Questionnaire, in this week's Distro. 



MARC PERTON
EXECUTIVE EDITOR,
ENGADGET



NEXUS LOGJAMS, MINI MISNOMERS AND SOCIAL DOWNERS



Touch article names
to read full threads

DISTRO
08.02.13

INBOX



NEXUS 7 (2013)
ISSUE 100,
JULY 26TH, 2013

“Looks like I’ve waited
just long enough to get
my first tablet!”

— **JUST_ANOTHER_
ENGADGET_USER**

“Looking forward to
the hours of frustration
which will surely occur
on July 30th when Google
Play gets flooded with
purchase requests, and
Google is unable to prop-
erly handle the traffic.
Brings back fond memo-

ries of buying my Nexus 4
and Nexus 10!”

— **DDB**

HTC ONE MINI
ISSUE 100,
JULY 26TH, 2013

“A 20-inch TV is con-
sidered mini today...

Same thing is happen-
ing with smartphones...
anything smaller than
average can be classified
as ‘mini.’ With Android,
4.7 inches is average
screen size. So anything
4.3 and under can be
considered ‘mini.’”

— **MALC_MILLI**

“It’s a nice-looking
phone, but it’s so
close in size to the
regular HTC One
that it’s pretty
comical to call this
phone ‘mini.’
When does the *micro
mini* come out?”

— **ROBJOO**



NOKIA LUMIA 625
ISSUE 100,
JULY 26TH, 2013

“I am sure this phone will be a hit, a big screen and LTE in such a cheap phone is very promising. Seems like Nokia knows where they are heading now, bringing [a] broad line of WP phones to the public.

I bet in a year or two they will be selling more smart-phones than Apple.

This phone is a good example of a phone that fits perfectly for people who need a reliable phone with useful features at a reasonable price — in other words, this phone is for the masses.

PLAYED OUT
ISSUE 100,
JULY 26TH, 2013

“I can’t see BB succeeding in the tablet space. Their best bet is to make a BB Win8 Pro tablet and build their software onto that.”

— WANSAIOUNKEO

Email, best available navigation, internet, music, camera, readable screen in sun, big screen, LTE for data speed where it matters. Quality build. Stable OS. It is all there and much more...”

— SEXYJON

**APPLE’S DASH FOR
THE DASHBOARD**
ISSUE 100,
JULY 26TH, 2013

“As a car enthusiast I am always helping my friends install stereos and systems, and I could see this as an awesome addition to the lineup of car audio. Although I could see some of the apps and programs being shut down by the DOT and other government organizations. I have been looking for things like this for quite a while and have almost gone as far as building Nexus 7 consoles for cars. Hopefully they can pull this off at an affordable price and I can get to work installing this into peoples’ cars.”

— RILEYJOHNSON



“I don’t want my car to be tied to a certain platform. I change my gadgets far more often than I do my car and I just want my car to connect to my phone no matter what OS it is running.”

— DUNCANATOR

SOCIAL NETWORKING MAKES US FEEL ALONE

ISSUE 100,

JULY 26TH, 2013

“My doctoral dissertation was a research study on how technology usage correlates with depressive symptoms. As part of it, I did research on social networking and found that it is a double-edged sword. Typically, for someone who is depressed, lonely and isolated, social networking provides positive benefits and reduces depressive symptoms. However, sustained social networking tends to have more negative effects in the long run. It is believed this is due to the superficial and transient nature of many of the relationships one develops online

(sans family and real-life friends, of course). Which ends up leaving an individual possibly

questioning their place in society, are they worthwhile, etc.”

— DR.COGNITIVE

NOKIA LUMIA 1020

ISSUE 100,

JULY 26TH, 2013

“The image quality is particularly impressive at this early stage. I can only imagine how much better they’ll get over time when Nokia makes tweaks and improvements.”

— KENHES



ENTER

DISTRO
08.02.13

EYES-ON

**RAZER
ATROX**



ADAPTIVE FIGHT STICK

When we laid hands on Razer's Atrox fight stick at the Tokyo Game Show last fall, we were taken by the seemingly infinite possibilities that its hacker-friendly design allows. The configurable construction also offers interior storage and customizable graphics for Xbox 360 gaming sessions.

THE DAMAGE: \$199



ENTER

DISTRO
08.02.13

EYES-ON

**RAZER
ATROX**



STORE IT

In addition to a customizable housing, internal storage compartments stow a second joystick or any components that you may need on the go.



ENTER

DISTRO
08.02.13

EYES-ON

**RAZER
ATROX**



DAMAGE CONTROL

The top side of the Atrix houses a Sanwa Denshi button and joystick combo that serves up a genuine arcade-style feel for console titles.

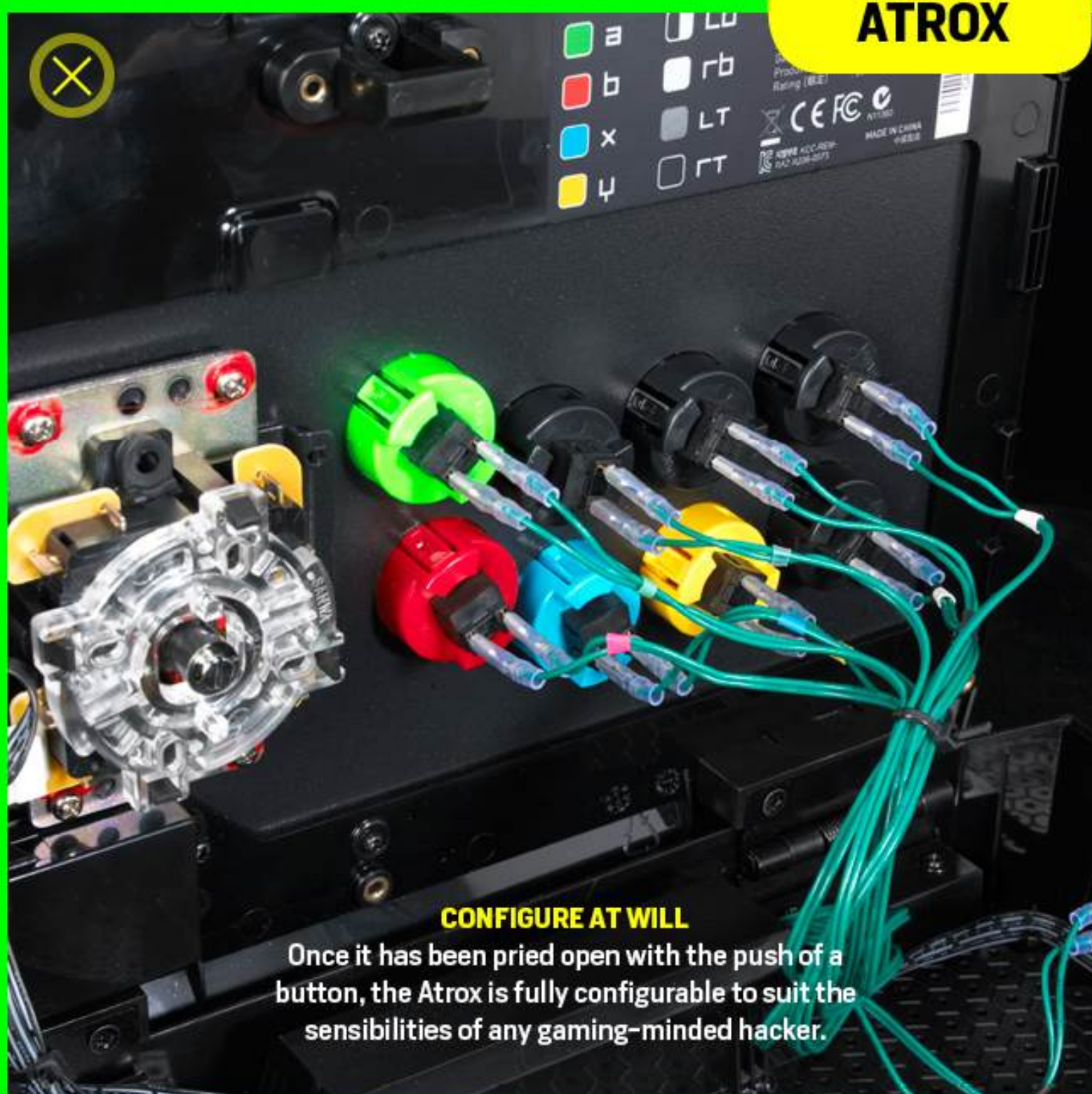


ENTER

DISTRO
08.02.13

EYES-ON

**RAZER
ATROX**



CONFIGURE AT WILL

Once it has been pried open with the push of a button, the Atrax is fully configurable to suit the sensibilities of any gaming-minded hacker.



DISTRO
08.02.13

ENTER

HANDS-ON



Click on
product
names to
read full
stories

CHRISTIE AND NVIDIA INTERACTIVE DESIGN STUDIO

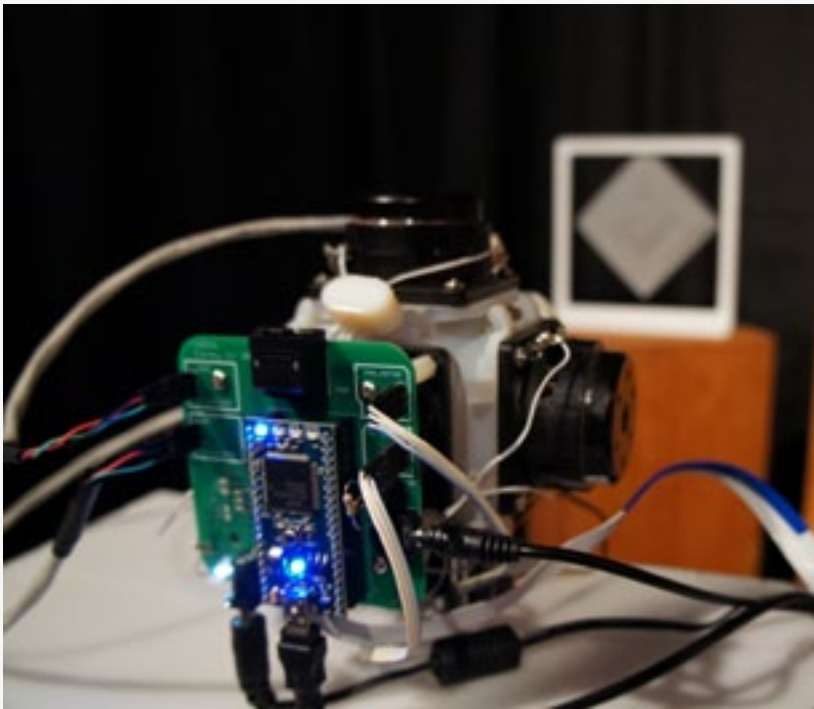
If committing the requisite funds for an Audi R8 coupe seems like a stressful ordeal, NVIDIA and Christie have created an augmented reality purchase experience to lend a hand with the selection process. Under the hood, NVIDIA GPUs, Christie projectors and RTT DeltaGen software for car configuration power the whole lot. Using a 3D-printed, one-fifth scale model of the R8, a series of projectors and projection tiles utilize a 3D WARP mesh to outfit the car with paint, wheels and even headlamps. A tablet UI then allows the eager customer to toggle colors, rim options, side panels and turn the lights on and off. In addition to customizing the car itself, the system also shows how the R8 will look in different environments, from dusk by the water to the rural open road.

PRICE: NOT FOR SALE

AVAILABILITY: SIGGRAPH DEMO

THE BREAKDOWN:
CUSTOMIZING A NEW RIDE IS
MADE INTERACTIVE WITH A
TABLET, 3D-PRINTED MODEL
AND MORE.





DISNEY RESEARCH AIREAL

If you're hoping to get some more tactile feedback out of augmented reality environments, the folks at Disney Research have devised the AIREAL system that could end up doing just that. The team showed the project off at SIGGRAPH's Emerging Technologies space, so we made sure to stop by for a look and feel. As a quick refresher, the technology reacts to the user's gestures by churning out a vortex of air to pro-

PRICE: INTERNAL PROJECT

AVAILABILITY: RESEARCH PHASE

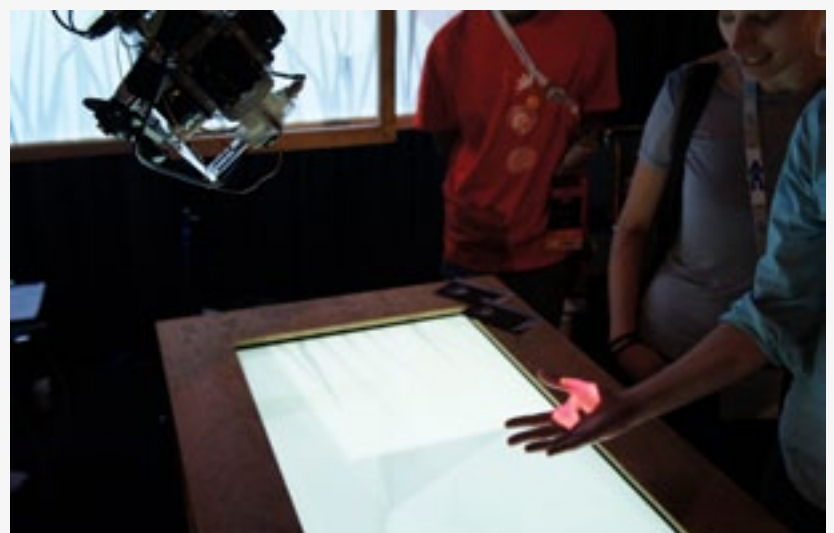
THE BREAKDOWN: AIREAL BRINGS TACTILE RESPONSE IN FREE AIR TO AUGMENTED REALITY WITH THE HELP OF 3D PRINTING.

vide tactile feedback in real space — thanks to an almost entirely 3D-printed enclosure and a smattering of actuators and depth sensors. In the demo we saw, hovering our hand just over a display summoned a butterfly.

Once it landed, that small bit of air offered up the physical sensation that it was actually touching us. As we moved closer to a virtual open window, wings went aflutter and the whole sensation increased a bit. Sure, what we saw was a fairly simple use scenario, but there are aspirations for this to enhance gaming experiences and other augmented environments (likely within the confines of a Disney park, of course) with the addition of haptic feedback.



Click on
product
names to
read full
stories





NVIDIA NEAR-EYE LIGHT FIELD DISPLAYS

A quick stroll through the Emerging Technologies section of SIGGRAPH usually reveals a collection of university projects and the latest Disney Research endeavor. We don't usually see the likes of NVIDIA amongst the fold there. This time around, though, the component maker is showing off an undertaking from its Research sector: near-eye light field displays. To show the project off, a pair of OLED microdisplays

were installed on a glasses-like frame with a box for the electronics stashed up top. Those Sony ECX332A panels measure 15.36 x 8.64mm and wield a resolution of 1,280 x 720 through 24-bit color pixels (which equates to a smidge over 83 pixels per millimeter). The diminutive displays open up the door for thinner and lighter head-mounted units that can sort "accurate accommodation, convergence and binocular-disparity cues."

The light field that's constructed directly over the pupil allows the viewer to focus at multiple depths and create a field of view of about 70 degrees. Both of those aspects were quite apparent to our peepers upon getting locked in for a quick demo. Despite being situated so close to the eye, the unit still provides some sharp images that we witnessed first-hand. Of course, the close proximity causes some pixel loss at the hands of a decreased spatial resolution. One pretty neat aspect to this whole system is that software tweaks can be made to account for someone's glasses or contacts prescription — software that's powered by NVIDIA GPUs and OpenGL, of course. Without having to modify the hardware, changes to the microdisplays are sorted sans the need to switch to another set or make physical adjustments.

PRICE: INTERNAL PROJECT

AVAILABILITY: RESEARCH PHASE

**THE BREAKDOWN: MICRODISPLAYS
POWERED BY NVIDIA GPUs WIELD
LIGHT FIELD FOCUSING ON SLIMMED-
DOWN EYEWEAR.**



Click on
product
names to
read full
stories





CANON MREAL HAND-HELD DISPLAY (HHD)

As a complement to its MREAL mixed reality headset, Canon showed off a hand-held version of the technology at SIGGRAPH. The new version functions much like the head-mounted one, enabling the use of markers or — as was the case here — sensors to render images in real space. Something you'll want to keep in mind: this is still an enterprise-focused device. That said, it doesn't make the tech demo and usage scenarios any less cool to gawk at. The demonstration we saw here in Anaheim involved a Kabuki dancer out in the center of the demo area. Details like shadows and wrinkles in the performer's clothes were rendered in real time — just as if a real person were performing. A col-

PRICE: TBD

AVAILABILITY: TBD

THE BREAKDOWN: THE HAND-HELD VERSION OF CANON'S MREAL EXTENDS THE OUTFIT'S MIXED REALITY EFFORTS.

lection of sensors mounted around the top of the demo stage allowed us to explore the space while the projected image reacted to our position. Not once did we lose sight of the action.

Two other demos for the head-mounted display (that can easily translate to the hand-held unit as well) caught our attention, too. First, a boat motor was projected in real space using augmented reality markers, allowing the user to inspect a scale model of the engine for training or other purposes. The ability to deconstruct the engine and see how different portions of it worked was all viewable. Next, we saw a set of markers wrapping a rectangle to project a model of a Canon DSLR housing. Both of these scenarios offer a more in-depth look at 3D models before the prototyping phase or any steps are taken toward production. **D**



Click on
product
names to
read full
stories



Billion Dolla' Dolla' Bills Y'all: Earnings Are Back

At the close of another quarter, the Benjamins are stacking up for tech's major players. However, it's not all champagne and roses in the boardroom. Apple saw a drop in iPad and Mac sales; operating losses continued for Google's Motorola

division; Microsoft took a hit on Surface RT; and Samsung warned of slowing mobile growth. Sure, there were a few down-sides, but, as the numbers show, when you have profits in the billions, it can't all be bad news. — *Christopher Trout*

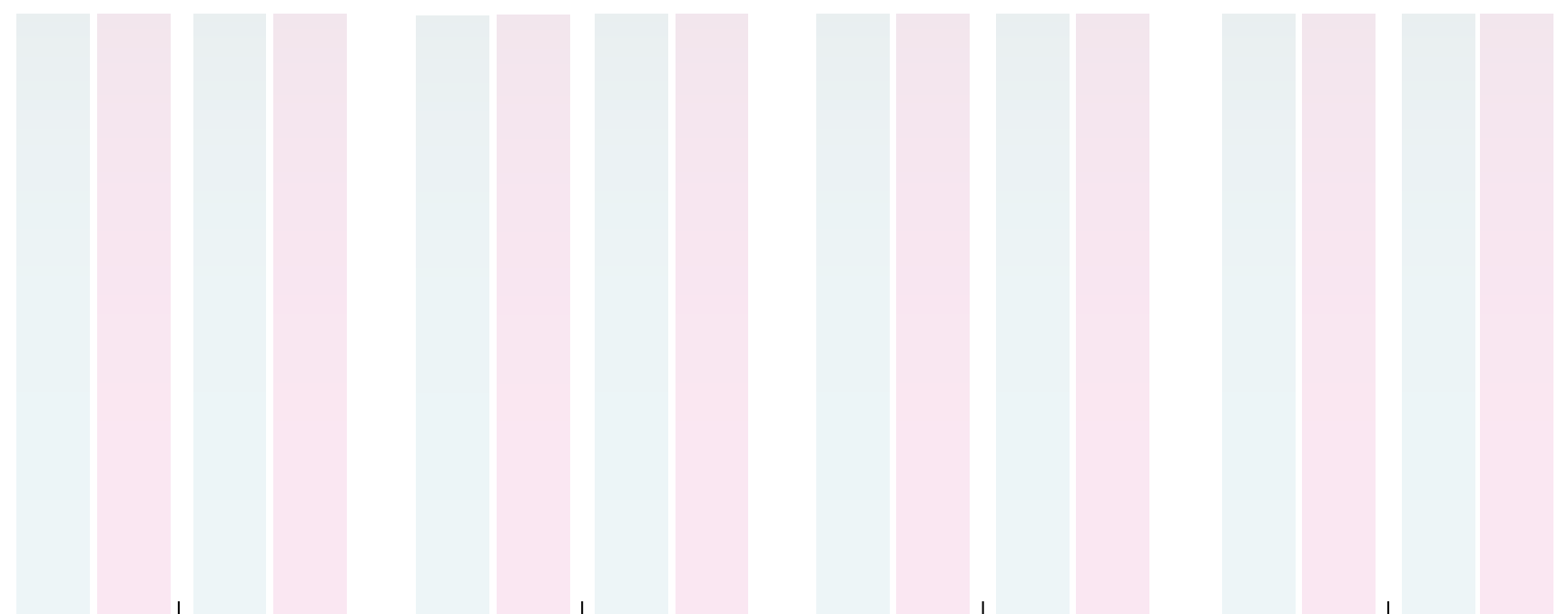
LATEST FINANCIAL RESULTS YEAR-OVER-YEAR AND QUARTER-OVER-QUARTER

2012

TAP
FOR
INFO

2013

SOURCE: GOOGLE, MICROSOFT, APPLE, SAMSUNG



GOOGLE

While Google saw a significant gain in revenue year-over-year, Motorola's operating loss increased to a whopping \$342 million from \$199 million the year prior.

MICROSOFT

Redmond pointed to declining PC shipments after announcing a \$900 million charge related to Surface RT adjustments.

APPLE

Despite record iPhone sales, Apple experienced declines in Mac and iPad sales as well as a significant drop in profit year-over-year. iPod sales also continued their downward sales spiral.

SAMSUNG

The numbers painted a pretty picture with profits up over the same period last year, but Samsung warned of a darker forecast for future mobile growth.



Billion Dolla' Dolla' Bills Y'all: Earnings Are Back

At the close of another quarter, the Benjamins are stacking up for tech's major players. However, it's not all champagne and roses in the boardroom. Apple saw a drop in iPad and Mac sales; operating losses continued for Google's Motorola

division; Microsoft took a hit on Surface RT; and Samsung warned of slowing mobile growth. Sure, there were a few down-sides, but, as the numbers show, when you have profits in the billions, it can't all be bad news. — Christopher Trout

LATEST FINANCIAL RESULTS YEAR-OVER-YEAR AND QUARTER-OVER-QUARTER

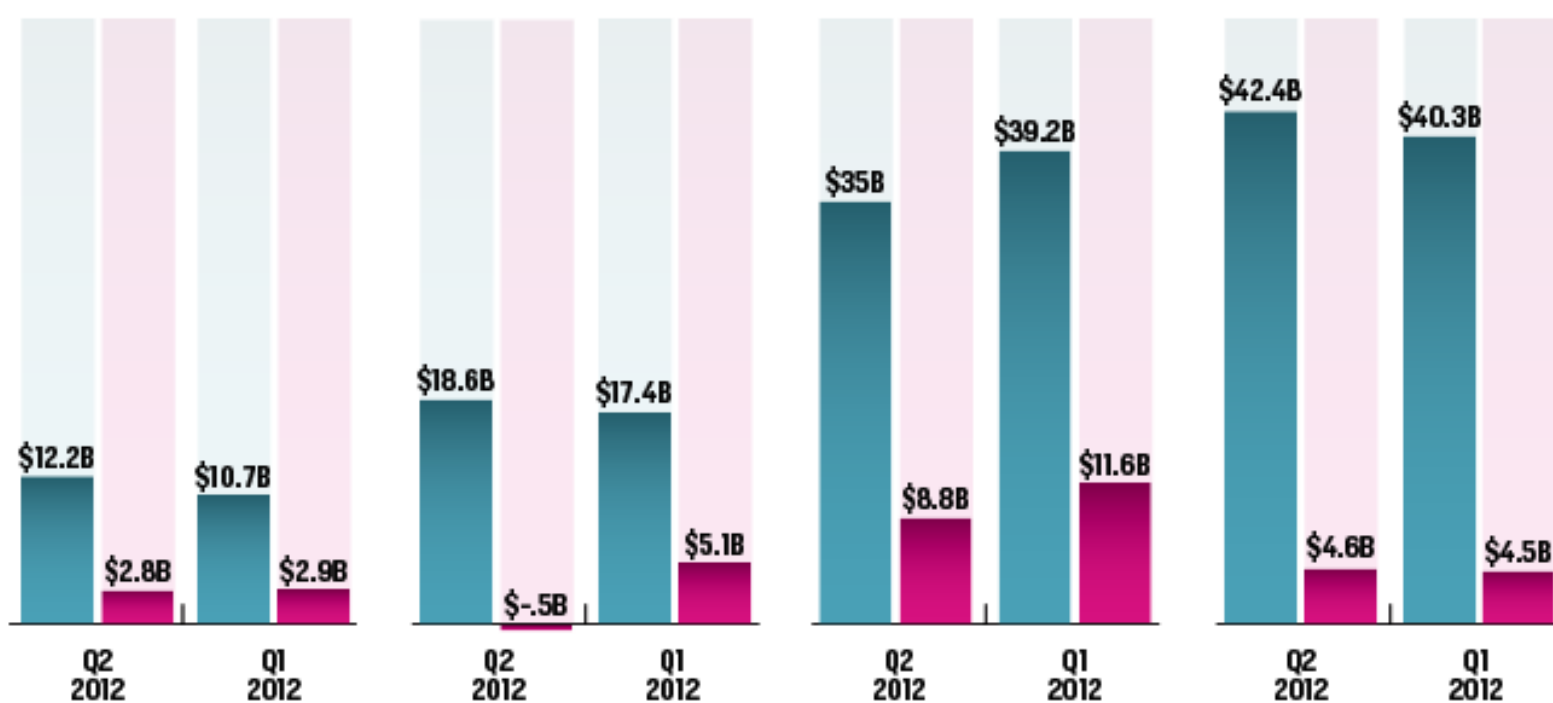
REVENUE
PROFIT

2012

TAP
FOR
INFO

2013

SOURCE: GOOGLE, MICROSOFT, APPLE, SAMSUNG



GOOGLE

While Google saw a significant gain in revenue year-over-year, Motorola's operating loss increased to a whopping \$342 million from \$199 million the year prior.

MICROSOFT

Redmond pointed to declining PC shipments after announcing a \$900 million charge related to Surface RT adjustments.

APPLE

Despite record iPhone sales, Apple experienced declines in Mac and iPad sales as well as a significant drop in profit year-over-year. iPod sales also continued their downward sales spiral.

SAMSUNG

The numbers painted a pretty picture with profits up over the same period last year, but Samsung warned of a darker forecast for future mobile growth.

Accounting practices and fiscal calendars may vary from company to company.
Samsung estimates based on current exchange rates: 1 KRW = 0.00089 USD.

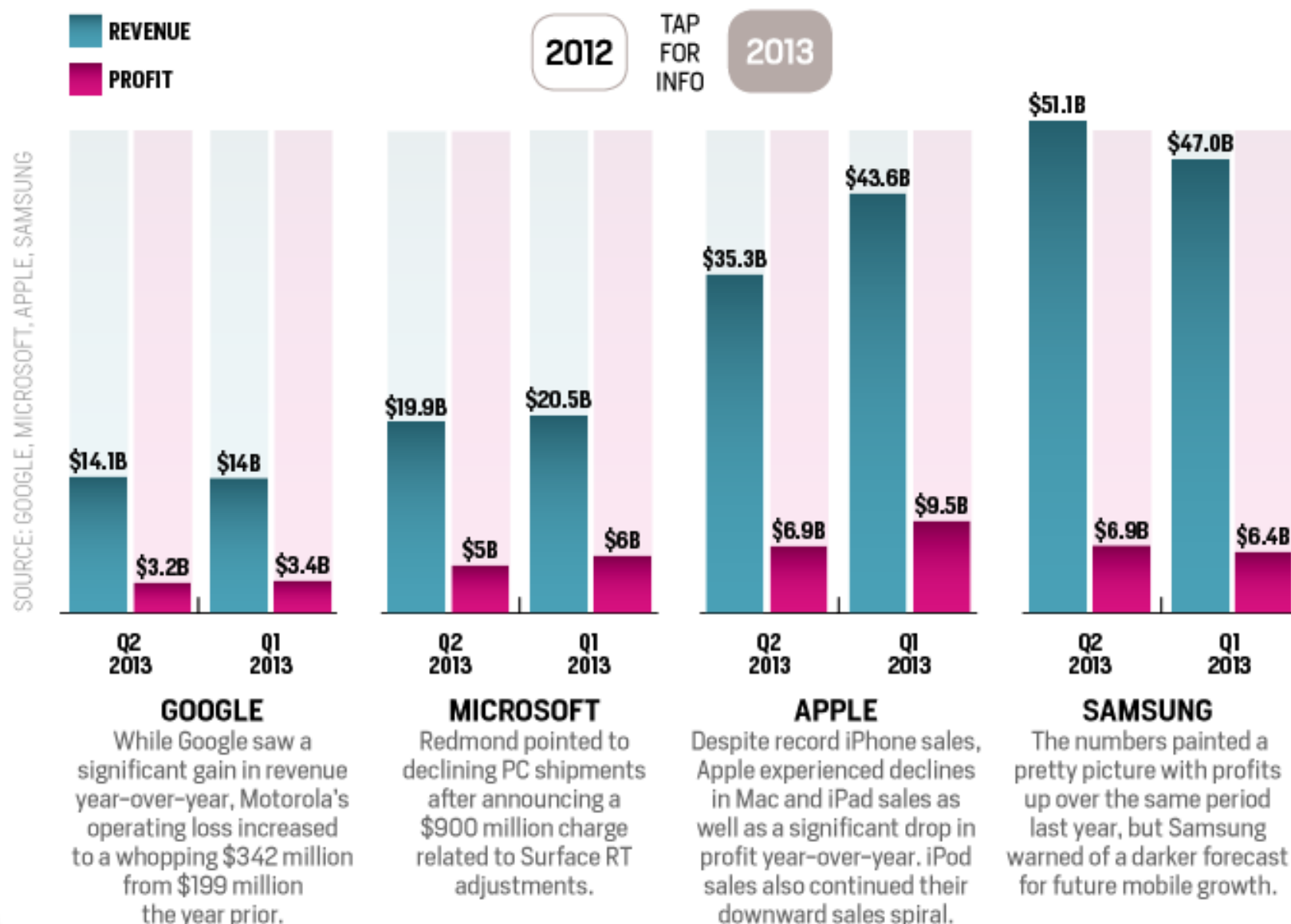


Billion Dolla' Dolla' Bills Y'all: Earnings Are Back

At the close of another quarter, the Benjamins are stacking up for tech's major players. However, it's not all champagne and roses in the boardroom. Apple saw a drop in iPad and Mac sales; operating losses continued for Google's Motorola

division; Microsoft took a hit on Surface RT; and Samsung warned of slowing mobile growth. Sure, there were a few downsides, but, as the numbers show, when you have profits in the billions, it can't all be bad news. — Christopher Trout

LATEST FINANCIAL RESULTS YEAR-OVER-YEAR AND QUARTER-OVER-QUARTER



Accounting practices and fiscal calendars may vary from company to company.
Samsung estimates based on current exchange rates: 1 KRW = 0.00089 USD.





Confessions of a Google Glass Explorer

By Gary Shteyngart
The New Yorker

User accounts of life with Google Glass may have lost some of their novelty by now, but the device continues to inspire writers to explore its use and implications. None have been quite like this essay from novelist Gary Shteyngart for *The New Yorker*, though, which recounts his experience using (and being observed using) Glass on the subway, at a museum, at bars and in other everyday situations. Shteyngart also takes a moment to look at the sheer pace of technological change, reflecting on how his near-future novel, *Super Sad True Love Story* — with its own wearable technology — “proved prescient all too quickly,” and made him “feel like a very limited Nostradamus, the Nostradamus of two weeks from now.”

COURTESY OF GOOGLE

**Douglas Engelbart's
Unfinished Revolution**
By Howard Rheingold
MIT Technology Review

“Doug Engelbart knew that his obituaries would laud him as ‘Inventor of the Mouse,’ Howard Rheingold writes in this piece for *Technology Review*, which helps explain why he should be remembered for so much more, and how he worked in later years to try to fulfill that vision.

**Not Even Silicon Valley
Escapes History**
By Alexis Madrigal, *The Atlantic*

The legacy of the early days of Silicon Valley is well known today, but the epicenter of that Silicon Valley may not be quite what you’d expect today. Alexis Madrigal compares that past to the present in this piece for *The Atlantic*, mapping out historic sites against their often mundane counterparts today.

**When ‘Smart Homes’ Get Hacked:
I Haunted A Complete Stranger’s
House Via The Internet**
By Kashmir Hill, *Forbes*

Most folks may not yet be concerned about someone hacking their house, but it has already been an issue for some, and will no doubt only become a more common occurrence as smart homes become the norm. Here, Kashmir Hill looks at some recent exploits, and the security concerns they raise for the future.

**They Know Much More
Than You Think**
By James Bamford
The New York Review of Books

NSA chronicler James Bamford offers his latest piece on the agency in *The New York Review of Books*. In it, he looks at exactly how much it knows based on the information that’s already been revealed, and how much more it might know that hasn’t yet been made public.



Click on
headlines
to read full
stories



THE CAMERA PHONE

DISTRO
08.02.13

FORUM

SWITCHED
ON

BY ROSS RUBIN

IN THAT HUMAN-behavior lab known as the New York City subway, a vacationing family recently sought to get in a group self-portrait on their last day in the Big Apple. But the rocking train kept thwarting the capture of their jostled bodies. To frame the picture, they tried trading the quality of their smartphone's rear camera for the one above the phone's display so they could better preview the picture, but still had trouble composing the shot. Finally, a local passenger riding with them stepped in and offered to take their photo, which he did to their expressions of gratitude.

The incident served as an illustration of the often precarious situations in which we use our smartphone cameras. Had their phone been Nokia's Lumia 1020 and the stranger not intervened, the 41 megapixels of light-capturing prowess might have gone for naught as the family would've had to rely on the phone's middling front-facing camera.

And that would have been a shaky shame. Nokia's marketing push of equating cropping with zoom may be off-putting to purists. Nonetheless, the phone's image quality is astounding. It captures vivid colors and stable images in low light that vastly exceed those of any other cameraphone, even as many have stepped up their imaging games. The 1020's shooter is such a signature



feature that the company is displaying it in stores with its circular, rear imaging hump facing customers.


Since adopting Windows Phone as its strategic smartphone operating system, Nokia has made great progress in stepping up the pace of its smartphone production. In fact, recent comments by Nokia executives have indicated that it wants Microsoft to increase the frequency of Windows Phone releases to keep up. But the recovering phone giant still has a knack for stealing its own thunder. The fabula industrial design of the Lumia 800 first appeared in the MeeGo-based N9 and the 41-megapixel camera of the Lumia 1020 appeared (in fatter form) in the Symbian-based PureView 808, but implementing the latter on Windows Phone has had pros and cons.

On one hand, even Microsoft has been in step with Nokia on scaling back marketing of the now Windows Phone benefits to let its imaging system, complete with mechanical shutter and Xeon flash, take center stage. (Similar toning down of OS benefits took place with the introduction of the Galaxy S 4 and HTC One as the versions of Android they ran were both old news.) Nokia integrated its imaging interface well with its now-strategic operating system and has seen the launch of a few key imaging apps such as Vine that would have been more difficult to attract to Symbian. These include Hipstamatic, which can share to Instagram, but it's a sore point

“Nokia’s marketing push of equating cropping with zoom may be off-putting to purists.”

that the hottest image-sharing app is something even the Lumia 1020’s high resolution can’t yet capture.

The Lumia 1020 isn’t quite a one-trick pony; Nokia made enhancements to its sound recording as well. But the weight of focus on one feature — impressive as it may be — with a downplaying of a still-evolving app ecosystem recalls an era of feature phones that was kind to Nokia. That, plus its outlier \$299 subsidized price point, begs the question — which customers will it attract?

It is the phone for advanced amateur and pro photographers when they are not carrying a device like a Canon G series or Nikon Coolpix P7000; Nokia clearly catered to that crowd with its battery grip accessory. Beyond that, the 1020’s impact will more likely be felt in subsequent Lumias that offer a portion of its rich visual feast in a more affordable menu option at a more upscale Windows Phone restaurant. 



THE SINISTER SIDE OF THE '80s BBS

DISTRO
08.02.13

FORUM

THIS IS THE
MODEM WORLD

BY JOSHUA FRUHLINGER

Some of the following, for legal reasons, may or may not be fictional.

My first modem was a 300-baud Apple-Cat II. It was an expansion card for the Apple II and simply plugged into a phone line. It was, simply put, a badass piece of technology that turned me into a total digital delinquent. While my parents thought I was innocently learning to code BBSes (bulletin board systems) I was actually learning how to get things for free and paving the way for software pirates, phone phreaks and straight-up frauds of the future.

The Apple-Cat II could connect to other Apple-Cat IIs at 1200 baud, which made file transfers pretty quick for the time. This meant we could trade entire games in about an hour. We'd log into bulletin board systems, share lists of things we had and set up times to dial one another to trade games. Usually a barter would take place — your *Aztec* for my *Hard Hat Mack*. It was a lot like trading baseball cards, I imagine.

I had about 350 5.25-inch disks alphabetized in a giant plastic case. They were mostly games, a few productiv-

ity applications of the time that I never used and a nice little collection of insidious apps that helped me do things way beyond simple file transfers.

First there were the war dialers. These, on the surface, were harmless applications simply designed to scan the local telephone exchange for other computers. You'd enter some parameters — dial in this or that prefix only — and leave it running overnight. You'd wake in the morning to a decent list of computers, hopefully BBSes. Then you'd dial each one of them until you found a BBS that looked interesting, and by "interesting" I mean filled with delicious warez.

Once you had a couple prospects, you'd prove yourself to the SYSOP (system operator) by uploading a choice piece of warez gratis. It would have to be something he — or she — was specifically looking for, so this would sometimes turn into a little side quest on its own. Usually you could find what the SYSOP was looking for on another BBS, and, like a drug mule, add that file to his or her collection.



“If all you did was download warez, you’d be labeled a leech and be kicked off the system.”

Once you were in the BBS with a username and password, you’d need to keep a close eye on your upload / download ratio. If all you did was download warez, you’d be labeled a leech and be kicked off the system. If you provided a ton, especially first-party software cracks, you’d be deemed a clan leader and reap much respect (and fresh warez to crack). Above those clan leaders were the software crackers, the people who could remove copy protection from games and other apps to allow them to run without asking for a serial number or other form of DRM at the time.


On the even darker side of ‘80s modem fun, there were phone phreaking programs that would do a couple things. Some would dial into corporate exchanges and look for outside lines meant for traveling businessmen. Those were gold, as they allowed us to make long-distance calls to BBSes outside our area code during a time when phone companies charged by exchange. Others would dial into credit card authorization systems looking for good card numbers to be later used for equipment. My personal involvement stopped at that level as I couldn’t quite get my teenage head

around simply stealing computers. Plus, right as I got into the BBS scene, I witnessed a small group of online acquaintances get hauled off to jail in one of the first online fraud cases of its kind.

My personal favorite little Apple-Cat II trick was found in a little program called The Cat’s Meow. This allowed me to generate tones directly into the phone line while on calls. I could choose from a soundboard of tones that could do everything from speak in a computer voice to generate payphone coin sounds to extend calls with friends who were at the corner arcade.

Why did we do all of this? Mainly because we could, and we loved the technology. We recognized that the future of computing was online, and we were paving the way for future generations of bad boys and bad girls.

Funny thing is, piracy hasn’t changed all that much. If you were to take a look at modern warez exchanges on BitTorrent or Usenet, they’d look a heck of a lot like ‘80s BBSes — groups of people working underground to get their hands on the latest stuff, all regulated by equitable exchange networks that both protect those involved and assure a certain level of fairness, keeping the leeches at bay.

But most importantly, we could annoy girls with silly sounds while on the phone with them. That’s really what it was all about. We were bad, but the internet wouldn’t be the same if we hadn’t broken the rules early on. 



REVIEW

DISTRO
08.02.13

Hisense
Sero 7
Pro



CONTENTS

Google Nexus 7
(2013)



Google
Chromecast



NVIDIA
Shield



HISENSE SERO 7 PRO



Will Hisense's first Android slate, the **Sero 7 Pro**, bust the budget bubble or further cloud the 7-inch range?
By **Melissa Grey**

Hisense, a company best known for its home theater equipment, isn't exactly a name synonymous with mobile devices. But with its new, Walmart-exclusive line of Android tablets — the Sero 7 LT and Sero 7 Pro — the Chinese manufacturer is dipping its toe into an increasingly crowded pool. Both tablets occupy the budget end of the spectrum, with the higher-end of the two, the Sero 7 Pro, going for a reasonable \$150. For the price, the specs are decent: the Sero comes with a 1,280 x 800 display, a quad-core Tegra 3 processor and Android 4.2



Jelly Bean. We dove headfirst into this bargain buy to see how it fares against similarly priced 7-inch tablets. Want to find out if Hisense has the chops to compete? Read on, friends.

HARDWARE

Shopping for budget tablets is an exercise in managing one's expectations. With the Sero 7 Pro, Hisense seems to have strategically carved out its budget, using modest materials for the hardware. With dimensions of 7.87 x 4.95 x 0.43 inches, the Sero 7 is a comfortably sized tablet that feels fairly sturdy in-hand. And at 12.7 ounces, it's not the lightest Android tablet on the block either, but the slight heft does add to that feeling of durability. Design-wise, the plastic backing is textured to provide a decent grip, and the coppery hue looks more expensive than it is, especially in sunlight. Hisense seemed determined to prove that inexpensive materials don't necessarily correlate with an inexpensive aesthetic; the Sero 7's clean lines make for a nice-looking budget device.

Continuing our tour, the power button is located near the top of the device on the right-hand side, right above the volume rocker. Both are made from

Shopping for budget tablets is an exercise in managing one's expectations.

black plastic that feels a bit flimsy, especially compared to that textured backing. Along the top you'll find mini-HDMI and micro-USB ports, a covered microSD slot (which can handle up to 32GB), a 3.5mm headphone jack and a pinhole microphone. The HDMI-out is a nice touch, and it worked adequately when we paired it with a Sony HDTV to watch a few high-quality YouTube videos (included, we're not proud to admit, the "Sad Cat Diary" more than once). Should you decide to add the Sero 7 Pro to your gadget collection, you'll be happy to know that USB on-the-go is enabled, allowing you to use it with a flash

As a slightly heavier tablet, it feels a bit more durable.



drive, keyboard or mouse.

Out of the box, you'll find a sticker near the bottom of the device's backing, marking off the area where the NFC sensor lives. Right beneath that are two small stereo speakers (more on those later). An embossed Hisense logo sits in the middle, while a 5-megapixel rear facing camera and its accompanying light sensor sit near the uppermost edge. Also included are GPS, Bluetooth and 5GHz 802.11n. Lastly, the tablet comes with 8GB of internal storage space, so that microSD port will almost surely come in handy.

DISPLAY AND SOUND

While the Sero 7's hardware might lack a certain pizzazz, the same can't be said about the 1,280 x 800 display. This is one area where Hisense decided to splurge. Colors appear vivid, with dimension and depth. Blacks, which so often turn gray on mobile devices, look deep and dark here, and the screen gets bright enough to sear your eyeballs (a useful quality in direct sunlight). Additionally, the 7-inch screen offers great viewing angles without losing much color vibrancy when looked at from the side with the device lying flat.

From the rainbow-hued landscape of *Candy Crush Saga* to the eye-popping bubblegum pinks of Nicki Minaj music videos (played in HD, of course), the Sero 7's display served up rich, vibrant colors. Similarly, videos played back smoothly and beautifully. Text, in

Play Books and Chrome, was as crisp as you'd want it to be. For a budget tablet, the display was nothing to shake a stick at, and we were left considerably impressed with its quality.

Unfortunately, the quality wasn't as consistent when we got to the Sero 7's sound. It's not that the audio coming from the device's dual speakers was bad. Not at all. Mobile speakers are what they are — we weren't blown away by the Sero 7's audio capabilities, but they performed adequately, even at maximum volume. Tablet users are no strangers to the tinny effect that often accompanies their devices' audio, but it was less noticeable here than it was on a similarly priced tablet, the HP Slate 7. Dialogue and background music in movie previews played well, with the slight tinny echo more evident in songs that called for more bass than the Sero 7 could provide.

Our disappointment heightened when we tested the tablet with some headsets we had lying around. We discovered that the Sero 7 has pretty severe compatibility issues with more than its fair share of brands. When paired with Sony, Apple and Jabra earbuds, the Sero 7 didn't register that a headset had been inserted into the 3.5 mm jack, and the audio came out of the device's speakers as if our earbuds weren't even there. We had better luck with a pair of over-the-ear Panasonic headphones and TYLT Tunz earbuds. When the Sero 7 actually recognized that the headphone jack was in use, we were





Speakers
have the
same issues
we've seen
elsewhere.

sufficiently pleased with the quality, which was rich and true on the songs we tested despite the lack of an EQ setting in the tablet's main menu. However, the compatibility issue might be problematic if you find yourself needed to run out to purchase brand-new headphones to use with your device. No one wants to be bothered with that.

SOFTWARE

The Sero 7 comes with Android 4.2.1, which means it's lacking some of the most recent Jelly Bean features we've come to know and love. Beyond that, the tablet is running an almost stock version of Android, with minimal skin-

ning. There are a few apps preloaded to the device, some of which you might never use, but some which might actually prove beneficial to you. Because this is a Walmart exclusive, the Sero 7 is, of course, packing Walmart's own app, along with one for Sam's Club. If you're a Walmart shopper, that might be of use to you, but we simply shrugged and went on our merry way. If they really bother you, you can always uninstall them. Also loaded on the device are the VUDU Movies and TV app, and Kingsoft, a Microsoft Office clone that lets you create and edit .doc, .xls and .txt files.

In addition to Chrome, Gmail, You-



Tube and other standard issue Google apps, the Sero 7 also includes TegraZone, an app store for NVIDIA optimized games (which, like VUDU, cannot be uninstalled since they're system apps). It's not a bad addition, considering the device's NVIDIA quad-core Tegra 3 processor, but again, how useful it is is entirely up to you. For Flash support, the regular ol' Android browser is available for when Chrome doesn't suit your needs. Curiously enough, there's also a TV remote app, though without an IR sensor, it has limited usability. Your TV needs to be hooked up the same WiFi network as your tablet.

Applications aside, there have been a few tweaks to the standard Android 4.2.1 package. On the bottom navigation bar, Hisense has added a screen capture icon to the three we're used to (recent, menu and back). If you're accustomed to Android devices, you'll probably find yourself taking a ton of accidental screenshots as you

instinctively aim for the recently used apps icon (as we did), but it's actually a pretty neat feature. Some may see it as an unnecessary addition, but it's much easier than pressing the power and volume buttons down simultaneously to make screen grabs.

CAMERA

There's a reason tablet cameras have a bad rap: they tend to be downright awful. The Sero 7's rear-facing 5-megapixel camera isn't likely to change anyone's mind on that issue, but it does perform admirably considering our low expectations. There's a decent LED flash for low-light situations (so long as you're close to your target), along with a handful of customizable settings and filters that come with Android 4.2, like Photo Sphere and panoramic shooting. The auto-focus works well, so shaky hands won't ruin your photos as they would on something like the HP Slate 7's disappointing camera.

Outdoors, the camera fares pretty well. Indoors, so long as the lighting was good, the pictures were adequate, if unimpressive. In low-light settings, you'll be hard-pressed to get a decent photo, though the flash does help some. The 2-megapixel front

Hisense took care not to futz with Android 4.2.1 too much.





facing camera isn't terrible either, though admittedly, the bar is set absurdly low in that arena. Our sample photos weren't too grainy, and the webcam should do in a pinch for video chatting too.

The most disappointing aspect of the rear camera is its tendency to take forever to finish shots. Well, not forever, but long enough that more than a few photos resulted in blurred images due to moving the tablet before the camera had snapped the shot. The camera's activity is timed up with the snapshot animation, standard on Android devices, of the photo minimizing and sliding off to the

side. To get the picture you want to take, you have to hold the tablet for the space of another heartbeat to make sure the snap registered. When it comes to photos, the Sero 7 might not be the fastest draw in the West, but the quality does suffice for a budget tablet.

PERFORMANCE AND BATTERY LIFE

The Sero 7 Pro's 1.3GHz quad-core Tegra 3 processor, a mainstay in last year's tablets, still performs reasonably well. According to our benchmark tests, the Sero measures up decently against competing 7-inch tablets, besting the much beloved Nexus 7 on the likes of



Quadrant Advanced and AnTuTu while breaking almost even on CFBench. It does, however, display a few behavioral tics common to Android devices. Every now and then, we experienced some minor stuttering and delays, particularly when scrolling through our recently used applications.

Occasionally, it took more than one press of the power button to wake the tablet up from sleep (cut to a pint-sized Sero whining, “But Mom, just five more minutes!”). The biggest delay we noticed while using the device for day-to-day activities was the lag in adjusting its orientation. The accelerometer took a beat longer than we would have liked to register the tilt and switch from landscape to portrait (or vice versa) accordingly.

When browsing in Chrome, we ran into very few problems. Pages loaded relatively quickly, and zooming in and out caused minimal to no tiling. On websites that had a lot going on (large photos,

animated GIFs, et cetera), there was the occasional lag in scrolling, but it wasn’t enough of a problem to be too off-putting. On an extremely GIF-heavy Tumblr, we encountered very little latency in terms of zooming, loading and scrolling.

Games of varying complexity all ran without a problem on the Sero 7, which is hardly surprising considering the quality we’ve come to expect from Tegra 3 Android tablets. *Temple Run 2* and *Sonic the Hedgehog 4 Episode 2* both showed off the Sero’s responsiveness and smooth gameplay abilities. With the spiffy display, they both looked great as well. When shopping for the aforementioned games in the Play Store, we did run into some delays when it came to touchscreen typing and browsing, but those issues weren’t widespread across the device’s other applications.

Hisense promises seven hours of continuous video playback, so we were pleasantly surprised when our test ex-

TABLET	HISENSE SERO 7 PRO	HP SLATE 7	GOOGLE NEXUS 7 (2012)	SAMSUNG GALAXY TAB 27.0
QUADRANT	4,251	N/A	3,460	2,840
VELLAMO	1,692	1,426	1,383	978
ANTUTU	12,883	11,698	11,579	N/A
SUNSPIDER 0.9.1 (MS)	1,868	1,848	1,528	2,239
GFXBENCH 2.5 EGYPT OFFSCREEN (FPS)	11	12	9.7	N/A
CF-BENCH	11,322	6,790	11,650	N/A

SUNSPIDER: LOWER SCORES ARE BETTER



TABLET	BATTERY LIFE
HISENSE SERO 7 PRO	8:28
APPLE IPAD MINI	12:43 (WIFI)
SAMSUNG GALAXY TAB 7.7	12:01
APPLE IPAD (LATE 2012)	11:08 (WIFI)
APPLE IPAD 2	10:26
ASUS EEE PAD TRANSFORMER PRIME	10:17
SAMSUNG GALAXY TAB 10.1	9:55
APPLE IPAD (2012)	9:52 (HSPA) / 9:37 (LTE)
GOOGLE NEXUS 7 (2012)	9:49
MICROSOFT SURFACE FOR WINDOWS RT	9:36
APPLE IPAD	9:33
ASUS TRANSFORMER PRIME INFINITY TF700	9:25
PANTECH ELEMENT	9:00
MOTOROLA XOOM 2	8:57
SONY XPERIA TABLET Z	8:40
HP TOUCHPAD	8:33
SONY XPERIA TABLET S	8:31
LENOVO IDEAPAD K1	8:20
MOTOROLA XOOM	8:20
T-MOBILE G-SLATE	8:18
ACER ICONIA TAB A200	8:16
SAMSUNG GALAXY TAB 7.0 PLUS	8:09
GALAXY NOTE 10.1	8:00
LENOVO THINKPAD TABLET	8:00

ceeded the company’s estimate. With the brightness set at 50 percent, we looped a video at a resolution of 1,270 x 720, and the Sero chugged along for eight hours and 28 minutes before the battery called it a day. That number places it in the middle of the pack, as you can see in the table above. So, it’s not overly impressive, but when compared to similar budget Android tablets, it’s not too shabby either. During somewhat more quotidian usage, the Sero 7 (in balanced mode) happily survived an entire day of browsing, gaming, Facebooking and tweeting.

While the Sero 7’s 4,000mAh battery can’t quite catch up the Nexus 7’s herculean 10 hours on a charge, Hi-sense’s offering does have a reason to toot its horn. Three reasons, to be exact. The Sero 7’s power-saving modes offer three distinct tiers: Performance priority, balanced and power-saving



modes, which can all be switched on and off from the settings menu. With power-saving mode enabled, the Sero 7 Pro should get you through an entire workday. Our only complaint in terms of power management was the tablet's tendency to overheat. While it's pretty common for devices to warm up while charging, the Sero overheated when plugged in to the point where it was too hot to touch barehanded.

THE COMPETITION

Hisense is entering the wonderful world of Android tablets at an interesting time. Devices like the Nexus 7 (2012), now a year old, set the bar high for budget offerings, and everyone else has seemingly been entrenched in an elaborate game of catch-up with Google. The Sero 7 Pro has its flaws, but it does measure up pretty nicely against that Nexus 7 version — which is to say it's decent compared to an already out-dated device. It blows the low-specced HP Slate 7 out of the water, but considering how disappointed we were with that device, the odds were never in HP's favor to begin with.

At the top of the list is the Nexus 7 refresh (also reviewed in this issue). Released on July 30th with a price tag of \$230 for a 16GB WiFi edition, the

**The Sero 7 Pro
manages to put
up a good fight.**

new and improved model launches with Android 4.3, a quad-core 1.5GHz Qualcomm Snapdragon S4 Pro processor and a 1,920 x 1,200, 323-ppi display, making it one of the most pixel-rich tablets on the market. There's also the ASUS MeMo Pad HD 7, which could also give the Sero 7 a run for its money. With the 16GB version of the MeMo Pad retailing for \$150, the same price as the Sero, the argument can be made for holding out for a newer, more up-to-date device. With twice the internal storage for the same price, along with a 1,280 x 800 IPS display, the MeMo Pad looks to be the better buy, at least on paper.

Also on the market is Samsung's 7-inch Galaxy Tab 3, which just hit stores with a starting price of \$200 and somewhat underwhelming specs compared to the Sero 7 Pro and the MeMo Pad 7. Boasting a modest 1,024 x 600 display and eight gigs of storage, the price doesn't seem to justify the specs when you consider all the available options. Likewise, Acer's Iconia A1 tablet packs a quad-core 1.2GHz MediaTek processor and 7.9-inch 1,024 x 768 IPS display with a lower pixel count, but decent viewing angles.

WRAP-UP

As we said toward the top of this review, buying a budget tablet is frequently an exercise in managing one's expectations. Hisense hasn't established itself in the Android tablet market, and it's likely that won't happen for some time. All things





The Sero 7 Pro is able to hold its own in the 7-inch space.

considered, the Sero 7 Pro is a decent outing for a company without a proven track record in mobile devices, and at \$150, it's not a bad buy. With a gorgeous, color-rich display and a simple, sophisticated design, you could do a lot worse.

That being said, we were less than impressed with some of the device's audio playback issues, and we're not sure when

or if we can expect an upgrade to a newer version of Android. Otherwise, we were generally pleased with its performance, aside from the mild hiccups we've noted in other Tegra 3 devices running Android. One can argue that it might be wiser to go with a company with a proven record when it

comes to Android tablets, like ASUS, but the Sero 7 Pro still manages to put up a good fight in a crowded arena. **D**

Zach Honig contributed to this report.

Melissa is an Associate Editor at Engadget who writes novels in her spare time because she believes that having a social life is overrated.

BOTTOMLINE

**HISENSE
SERO 7 PRO****\$150****PROS**

- Nice design for the price
- Inexpensive
- Decent display

CONS

- Doesn't play nice with all headphones
- Unclear when or if a software update is coming

BOTTOMLINE

Hisense's first Android tablet almost pulls even with the competition, thanks to a stellar display and decent specs, but it's not without flaws.



NEXUS 7 (2013)



Does the second-gen
Nexus 7 keep Google's
place atop the list of
the budget best?
By Brad Molen

Who knew affordable tablets could be so good? That was our reaction after reviewing the original Nexus 7 when it went on sale last year for \$200; at the time, comparably specced products were going for at least \$100 more. So, when this year's follow-up came out at a slightly higher price (\$229 and up), we were a little concerned the higher cost would dissuade penny-pinching shoppers from taking the plunge.

After we got a good look at the spec sheet, though, we quickly forgave Google and ASUS for their decision. For the money, you get a gorgeous



1,920 x 1,200 IPS display, 2GB of RAM, a rear camera, a quad-core processor, wireless charging and the latest version of Android, Jelly Bean 4.3. Now that we've had the opportunity to take the new and improved Nexus 7 for a spin, we're ready to tackle all the obvious questions: is this still the best budget tablet on the market? How does it compare to the iPad mini? And does the spec sheet actually reflect real-world performance? Let's find out.

HARDWARE

Behold: the Nexus 7 2.0. The latest iteration of Google's small tablet takes everything we loved about the original and improves on it, all without adding much to the price. Google and ASUS —

the OEM in charge of designing the new device — whipped up the first Nexus 7 in just four months, an impressive feat for *any* company tasked with building a quality product. This go-round, the two tech giants had much more time to perfect the device, which bodes well for the quality here, we'd say.

On first glance, the new Nexus certainly bears an obvious resemblance to its predecessor, but closer inspection shows that ASUS actually made a few significant changes. Weighing 10.23 ounces (290g) for the WiFi-only model and 10.55 ounces (299g) for the LTE version, it's quite a bit lighter than the first edition, which tipped the scales at 11.99 ounces. At 200

x 114 x 8.7mm (7.87 x 4.49 x 0.34 inches), it's 1.5mm

This revamped Nexus 7 has a 1,920 x 1,200 IPS display.



taller, 6mm narrower and 1.8mm thinner as well. As you can imagine, then, while we didn't have a problem fitting the first tablet into our khaki pants pockets, this second-gen model is even easier to hold and tote around.

In terms of aesthetics, ASUS eschewed the plastic faux-metal edges and the dimpled rubber back of the original, opting instead for an all-black, all-plastic exterior with a matte finish on the rear cover. We'll admit that the rubber on last year's device was an unconventional choice, yet it helped make the device feel surprisingly durable. And besides, the textured material just felt pleasant to put your fingers on. That's all been removed, likely in an effort to make the tablet as compact as possible. All told, the difference is subtle, but still noticeable: the new Nexus is still a very solid device, but it feels just a tad more... *vulnerable*. Fortunately, its matte back at least offers a good grip while staying (mostly) immune to fingerprints. Always a plus.

On the front, the bezels surrounding the display are noticeably narrower — ASUS shaved off about 2.75mm on each side — but on the top and bottom they're as wide as

they ever were. According to the two companies, the idea is to ensure most users will have a place to hold the Nexus while using it in landscape mode (this is especially handy for games, we've noticed). Since those bezels have remained the same size even as the tablet has gotten narrower, the front looks a little awkward proportionally speaking, given the screen's 16:10 aspect ratio. We suspect the top and bottom bezels could have been trimmed a bit too, and it wouldn't actually have had much of an effect on the user experience.

While we're lingering on the tablet's front face, let's see what else is there. One thing you won't find on the device is a set of capacitive soft keys, since the Nexus 7 makes use of virtual navigation buttons instead. Above the display sits a front-facing camera, but it's curiously in a different spot than last time around. The OG version's camera was centered toward the very top, whereas this model

The face-lift sees the 2013 tablet slimmer and a touch taller.



puts the lens closer to the display and off to the right. If we had to guess, we'd wager that this was intended to make it easier to take selfies without worrying about your thumb getting in the way, but that doesn't explain why it didn't get pushed even closer to the right side of the device, since our thumbs still covered the lens on occasion.

When you flip over the Nexus, the first thing you'll notice — aside from the lack of dimples, of course — is that ASUS added a 5-megapixel camera in the top left corner (sorry, no LED flash). There are also three machine-drilled speaker grilles: a long one up top and two shorter ones on the bottom. That means you'll benefit from stereo sound,

a nice step up from the mono setup on the original. Cosmetically, the other major difference is that the Nexus logo is now displayed vertically in the center of the back cover, compared to the original's horizontal logo, which was located closer to the top. The 3.5mm headphone jack, meanwhile, now sits the top instead of the bottom. Finally, the power button and volume rocker live on the right side just above the mic, while the micro-USB SlimPort connector is sandwiched in between the speakers on the bottom. (As a sidenote, the Nexus 7 also supports USB OTG.)

Under the hood, the 2013 Nexus matches the original's in total internal storage.

Speaker grilles and a micro-USB sit at the bottom.



While it initially launched with only 8GB and 16GB versions (at \$199 and \$249 respectively), Google dropped the

baseline 8GB, lowered the price of the 16GB and added a 32GB model at the higher pricing tier. The Nexus 7 once

COMPARISON	NEXUS 7 (2013)	NEXUS 7 (2012)
PRICING	\$229+	\$199+
DIMENSIONS	7.87 X 4.49 X 0.34 INCHES (200 X 114 X 8.7MM)	7.81 X 4.72 X 0.41 INCHES (198.5 X 120 X 10.5MM)
WEIGHT	WIFI: 10.23 OZ. (290G); LTE: 10.55 OZ. (299G)	WIFI: 11.99 OZ. (340G); 3G: 12.24 OZ (347G)
SCREEN SIZE	7.02 INCHES	7.02 INCHES
SCREEN RESOLUTION	1,920 X 1,200 PIXELS (323 PPI)	1,280 X 800 PIXELS (216 PPI)
SCREEN TYPE	IPS LCD	IPS LCD
BATTERY	3,950MAH	4,325MAH
INTERNAL STORAGE	16/32GB	8/16GB
EXTERNAL STORAGE	NONE	NONE
REAR CAMERA	5MP, AF	NO REAR CAMERA
FRONT-FACING CAM	1.2MP	1.2MP
VIDEO CAPTURE	1080P/30FPS	720P (USING FRONT CAMERA)
NFC	YES	YES
RADIOS	VARIES BY MARKET; LTE/HSPA+/ GSM/EDGE	VARIES BY MARKET; HSPA+/GSM/ EDGE
BLUETOOTH	V4.0	V3.0
SOC	SNAPDRAGON S4 PRO	NVIDIA TEGRA 3
CPU	1.5GHZ QUAD-CORE KRAIT	1.2GHZ QUAD-CORE CORTEX-A9
GPU	ADRENO 320	ULP GEFORCE
RAM	2GB	1GB
WIRELESS CHARGING	YES	NO
WIFI	DUAL-BAND, A/B/G/N	B/G/N
OPERATING SYSTEM	ANDROID 4.3	UPGRADEABLE TO ANDROID 4.3



again offers 16 and 32 gigs (\$269) for now, although we'd certainly love to see a 64GB option come out down the road. Additional storage is important because the device *still* doesn't have a microSD slot, and we have a feeling that consumers will want to load the tablet up with HD movies and loads of music to take advantage of that sharper screen and stereo speaker setup. Obviously, then, storage space is of the essence.

The model we reviewed is a 32GB WiFi-only unit, with 26.1 gigs of that storage space actually accessible to the user. An LTE version (\$359) is also coming soon, though you can't buy it just yet. On that particular model, ASUS managed to squeeze six LTE frequencies (bands 1, 2, 4, 5, 13 and 17), penta-band HSPA+ and quad-band GSM / EDGE into its North American version, which means it will be compatible with AT&T, Verizon and T-Mobile in the US, as well as a smattering of operators in other parts of the globe. This is actually a pretty huge feat, as we haven't seen a device that's compatible with both Verizon and AT&T LTE before. There's also a European option, which provides seven LTE bands (1/2/3/4/5/7/20), penta-band HSPA+ and quad-band GSM / EDGE. Not too shabby.

Finally, anyone who enjoyed the optional dock with the first Nexus 7 will be disappointed to see it's MIA here. The new tablet does, however, offer Qi wireless charging out of the box. We tried it on multiple charging pads, including the Nokia Fatboy, Energizer dual pad and

Samsung GS4 pad, and it worked perfectly every time. If you're not equipped, you might at least be pleased to know that *iFixit's* teardown of the device revealed a Qualcomm PM8921 Quick Charge Battery Management IC, which allows for faster charging than conventional plugs (as long as you're using compatible adapters).

DISPLAY

When the Nexus 7 debuted last week, there wasn't any confusion as to which feature Google most wanted to emphasize: the display easily got the most lip service during the event. Last year's model had a perfectly acceptable 1,280 x 800 pixel IPS LCD panel, which was more than reasonable for a \$200 tablet. In this industry, however, a "perfectly acceptable" screen can magically transform into a piece of junk in a matter of months. Not to worry, though, as the new Nexus 7 has an increased resolution of 1,920 x 1,200, which translates to a pixel density of 323 pixels per inch, up from a puny 216 ppi on the OG model.

This is a massive improvement, and that improvement is obvious just as much in side-by-side comparisons. We know this can easily be said of any 1080p (or equivalent) screen, but the Nexus 7's display is simply beautiful. It offers more natural colors than the last-gen model, with amazingly crisp fonts and a generally much better canvas for playing games or watching movies. At the risk of sounding like we're making a shameless plug (we sort of are), we





The quality of the display here is a stand-out feature.

loaded up the latest issue of Distro on both tablets.

In short, the difference is astounding: the text here is bolder and easier to read, and the high-resolution screen exposes details in images that we simply couldn't see on the older screen. This isn't constrained to just Distro, of course; we noticed this with *all* the media we viewed. On top of all that, the screen delivers some great viewing angles, and is bright enough that you should have little problem reading it in direct sunlight. Simply put: the display itself is top-notch, but the fact that it's built into such an inexpensive tablet is even more impressive. In fact, it's a good enough reason you might want to

seriously consider grabbing one of these for yourself.

ANDROID 4.3

With new Nexus devices, Google typically introduces the next version of Android along with them. Unsurprisingly, then, the tablet comes with Android 4.3 out of the box. This piece of firmware still has the same Jelly Bean name Google has been using since version 4.1 debuted on the original Nexus 7 last year. Frankly, not a whole lot has changed this time around, but that doesn't mean everything has just stayed the same since the last upgrade came out almost nine months ago.

The biggest improvement here adds



restrictions to the multiple accounts feature that we already enjoy on tablets running Android 4.2. Before Google unveiled that version of the OS, the ability to switch accounts was pretty much nonexistent on mobile operating systems (though Microsoft introduced a similar feature called Kid's Corner on the same exact day). At any rate, the first iteration of the firmware generally worked fine, but there was a problem: there wasn't a way to add passwords or lock specific apps, an issue for parents who wanted to ensure their children weren't getting into something they shouldn't be. Fortunately, Google's addressed that issue — much to your 7-year-old's dismay. Interestingly, multiple user support is still MIA on Android smartphones, but Google engineer Dan Morrill explained recently on Reddit that his team is still figuring out the best way to handle phone-specific concerns like SMS and phone calls. Morrill said:

“Suppose you have device sharing enabled and then a call comes in. Who gets it? Do you punch through to the current user? Only the owner gets it? If only the owner can answer, does it ring for the second user? Is it worse to annoy the current user with a ringing phone they can't answer, or worse for dad to miss a call from his boss because Junior was playing *Angry Birds*?”

We wouldn't expect to see multiple user support on Android phones right

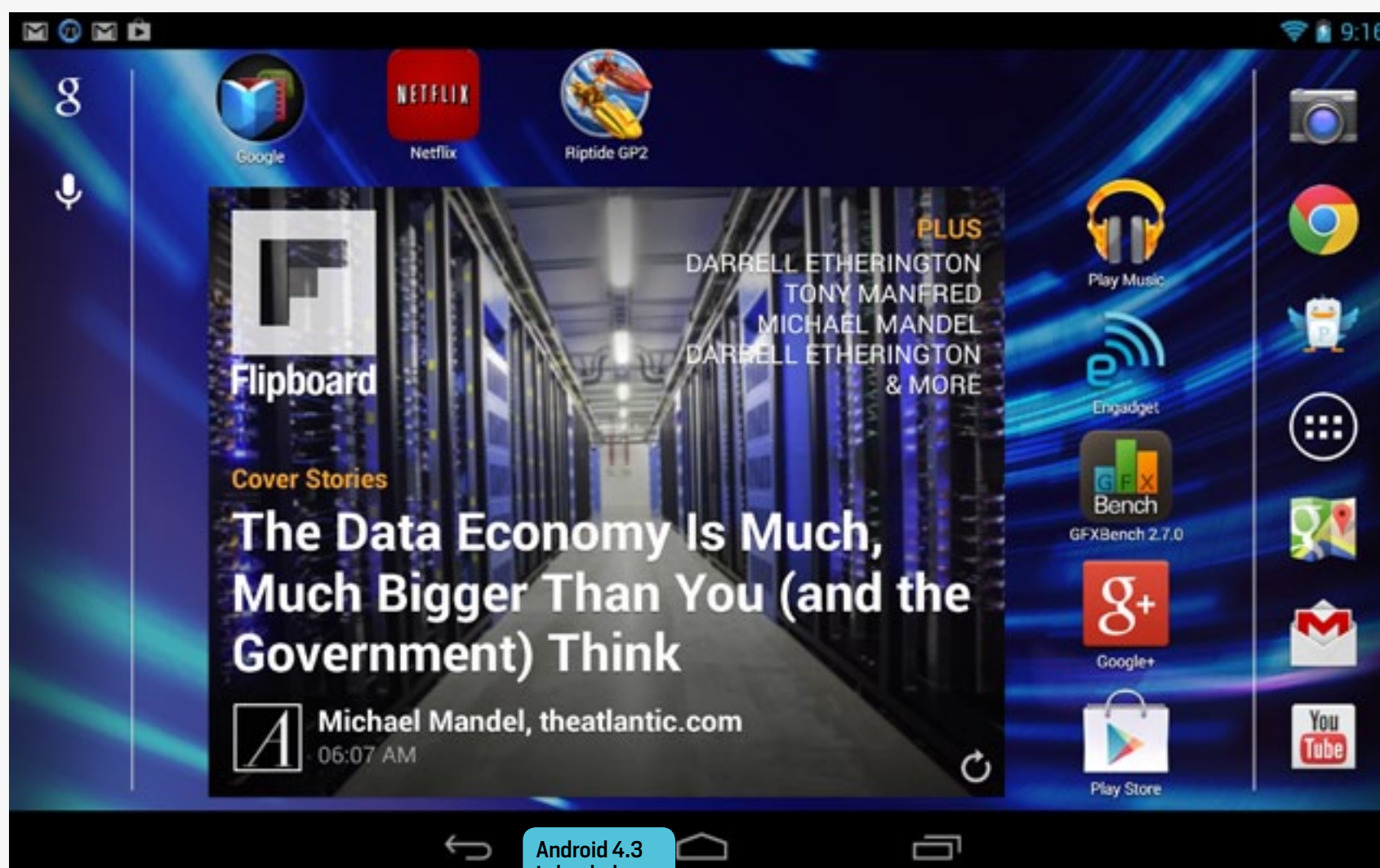
away, but it appears that the issue is at least on Google's radar, so hopefully a solution is on the way.

If you're a sucker for beautifully designed games with smooth graphics and copious detail, you may have been waiting for Open GL ES 3.0 to show up on Android. Fortunately, 4.3 officially supports the standard, and is currently available on the Nexus 4 and Nexus 10, in addition to the tablet we're reviewing here. Essentially, ES 3.0 brings acceleration of advanced visual effects, texture compression, 32-bit floating point support and more. There's also improved multi-threading across multiple CPU cores.

Android 4.3 also adds support for Bluetooth Smart, LE and AVRCP 1.3. For the uninitiated, Bluetooth Smart includes APIs that allow apps to access and receive your stream of notifications, and then display them however they want. Since this includes sending your status bar notifications to Bluetooth devices, this particular announcement is great news for users of wearables (think about what it could do for the Pebble smartwatch or even something like Google Glass). Bluetooth Smart is already available on the new Nexus 7 and the Nexus 4, with more devices to follow. AVRCP 1.3, meanwhile, ensures that users get better remote control functionality and more interactions with streaming media devices.

Here are a few other enhancements in Android 4.3:





- Optimized hardware geofencing APIs
- Dialpad autocomplete
- WiFi scan-only mode: the device can keep WiFi scan on without connecting to a network, improving location accuracy and battery efficiency
- New sensor types: game rotation vector, uncalibrated magnetometer and uncalibrated gyroscope
- Support for screens with 4K resolution
- Ability to pick and choose which app permissions you want to grant
- Improvements to Photo Sphere stitching
- Modular DRM framework
- On-screen GPU profiling

Lastly, users have already uncovered an easter egg in Google Play Games that

involves the Konami code. Swipe up, up, down, down, left, right, left, right and a box will appear with three buttons: A, B and start. You know what to do next; once you're done, you unlock a special achievement called "All your game are belong to us."

CAMERA

We were able to forgive the absence of a rear-facing camera on the original Nexus 7, because let's face it: tablets aren't exactly known for being stellar imaging devices. Of course, we're not going to complain that ASUS threw a camera in on the second-gen model; our expectations just aren't as high as they would be for, say, Nokia Lumia 1020 (or anything else of that ilk).



Since we just finished our discourse on the new features in Android 4.3, we'd be remiss not to discuss the camera app. As usual, you'll find the virtual shutter button and camera mode toggle switch (this is where you can change into panorama, video or photo sphere mode), though a dedicated settings key sits above both of these. Pressing this (or long-pressing the viewfinder) brings up a few options displayed in the form of icons above a small arc. It gives you the opportunity to switch to the front-facing camera, tweak exposure or go into more settings, not that there are many. You have white balance, scene

modes (night, action, sunset and party), timer and picture size at your disposal, but no HDR, ISO, shutter speed or any other type of adjustment. It's probably for the best anyway, since most images taken with a tablet camera will likely just wind up on Facebook, if you share them at all.

We half-expect every tablet camera to be a terrible piece of kit, but for what it's worth, the Nexus 7's 5-megapixel rear shooter is actually a decent performer — though it's not without its hiccups. Images are fairly detailed, though the colors become a little washed out

Shots were better than expected, but still fail to impress.



in sunlight and pictures are generally very noisy in low light (there's a night scene mode here, but it doesn't actually do much more than the default auto mode). The camera also couldn't reconcile shadows and highlights at the same time, so shady areas came out much darker than we would have liked. That being said, the shutter snapped pics fast enough for us to capture a few family memories without any motion blur. It also offers autofocus, another nice feature not found on a large number of tablets. Also, our images taken in low-light situations captured more light than we expected, even if we couldn't do anything about the noise.

To us, the front-facing camera is more important on a tablet than the rear; chances are, you'll be using the tablet for video chats more than you'll be taking impromptu snapshots. It's a 1.2-megapixel module up front, and it isn't at all memorable compared with what you'll find on other tablets. Still, it managed to capture my facial features pretty well, regardless of whether I was using it in sunlight or in a dim room after dark. Just like on the rear camera, though, there's still a ton of noise in lower-light situations.

Our video samples were in roughly the same shape as our stills: not acceptable on a flagship smartphone, but right on par with what you'll get from a typical tablet. The Nexus 7 records video at a max resolution of 1080p at 30 frames per second, with a bitrate

of 12 Mbps. The camera managed to maintain its focus no matter how many times we moved around. Of course, the lack of optical image stabilization means our footage was a little shaky at times (though it wasn't any worse than on other devices that also lack this feature). Pans were much smoother than we expected, and the mics picked up audio without much background noise to distract us. Unfortunately, despite the tablet's 1080p video-capture spec, the resulting movies were far from actual HD quality.

PERFORMANCE AND BATTERY LIFE

Last year, Google and ASUS impressed us when they delivered a tablet with an NVIDIA Tegra 3 processor for under \$200. Sure, it wasn't without issues, but overall it still offered solid performance for such an inexpensive device. Alas, NVIDIA wasn't invited to the party this time out: last year's quad-core, 1.2GHz Cortex-A9 chip (40nm) was swapped out for a smaller 28nm chip, a 1.5GHz quad-core Qualcomm Snapdragon S4 Pro (APQ8064) with Krait 300 cores, an Adreno 320 GPU and a very healthy 2GB of RAM.

The Snapdragon S4 Pro inside the new Nexus 7 has already been surpassed by the Snapdragon 600 (and soon the Snapdragon 800), but it still purrs along quite speedily. As you can see by the benchmark scores, the device is a huge improvement over the original. In real-life use, the tablet was



BENCHMARK	NEXUS 7 (2013)	NEXUS 7 (2012)
QUADRANT 2.0	6,133	3,710
VELLAMO 2.0	1,597	1,401
ANTUTU 3.2	19,755	11,679
SUNSPIDER 1.0 (MS)	602	891
GLBENCHMARK EGYPT 2.5 HD OFFSCREEN (FPS)	40	9.6
CF-BENCH	15,366	11,679

SUNSPIDER: LOWER SCORES ARE BETTER. BOTH DEVICES WERE TESTED ON ANDROID 4.3.

amazingly responsive and didn't show any lag, stutters or other symptoms of an overworked processor. Not bad, considering the new chip has to power that higher-res screen.

The Adreno 320 GPU featured here is one of the best you can get. Between that and Android 4.3's GL ES 3.0 support, we spent plenty of time enjoying *Riptide GP 2.0* to its fullest extent. ASUS has definitely taken the graphics up a notch; we could see an incredible amount of detail in the water, our avatar and our surroundings, and we never encountered any sort of disruption that interfered with the gameplay.

Since ASUS has made a considerable effort to slim down the new Nexus, we suppose it shouldn't come as much of a surprise to find that the battery is also smaller: it's been shrunk from 4,325mAh to 3,950. This was worrying at first, especially given the extra pixels that need to be lit up. In normal use, we discovered that the device could easily last us

at least a day and a half, and we could certainly push it longer by being more conscious about preserving battery life. Gaming and multimedia were unfortunately different stories: we drained the battery nearly 30 percent in just one hour of playing graphically intense games like *Riptide*. Our video rundown test, which consists of a 1080p movie playing back on an endless loop with the display on 50 percent brightness, yielded a life of seven hours and 15 minutes, which was much poorer than last year's Nexus 7. That tablet lasted nine hours and 49 minutes in the same test.

However, many of our commenters have rightly pointed out that the new Nexus 7 has a much brighter display, which may lead to faster battery drain when it's set at the same percentage instead of a nit-for-nit comparison.

The high-def display isn't the only area where Google and ASUS improved multimedia playback: we also noticed a massive upgrade to the audio quality as



TABLET	BATTERY LIFE
GOOGLE NEXUS 7 (2013)	7:15
APPLE IPAD MINI	12:43 (WIFI)
APPLE IPAD (LATE 2012)	11:08 (WIFI)
APPLE IPAD 2	10:26
ASUS EEE PAD TRANSFORMER PRIME	10:17
APPLE IPAD (2012)	9:52 (HSPA) / 9:37 (LTE)
GOOGLE NEXUS 7 (2012)	9:49
MICROSOFT SURFACE FOR WINDOWS RT	9:36
APPLE IPAD	9:33
ASUS TRANSFORMER PRIME INFINITY TF700	9:25
SAMSUNG GALAXY TAB 2 10.1	8:56
SONY XPERIA TABLET Z	8:40
HISENSE SERO 7 PRO	8:28
GALAXY TAB 2 7.0	7:38
HP SLATE 7	7:36
NEXUS 10	7:26
SAMSUNG GALAXY NOTE 8.0	7:18
RIM BLACKBERRY PLAYBOOK	7:01

well. As we explained earlier, the biggest change is the addition of an extra set of speakers on the top of the device, which means the new device offers stereo quality (rather than the mono

setup found on the previous version). The companies also partnered with Fraunhofer Cingo, which saw to it that Google Play movies can be watched in HE-AAC multichannel surround sound. Without question, the new Nexus is definitely loud enough in nearly every scenario. Our only quibble — and it's a small one — is that lower frequencies don't sound as prominent when you're listening through the speakers, so to get more complete bass you'll still want a good set of headphones.

THE COMPETITION

There's no shortage of smaller-screened tablets in the market, but the most talked-about are arguably the Nexus 7 and the iPad mini. Since we've already compared the new Nexus 7 to its older counterpart, let's see how it holds up against its iOS competitor. The iPad mini starts at \$329 for the 16GB WiFi version, a hundred dollars more than the Nexus; the 32GB WiFi is \$429, a difference of \$160; and the 32GB LTE option costs \$559, \$210 more than Google's equivalent. Granted, the iPad mini's display is an inch larger than the N7, which might affect the cost of the tablet. That said, how else does it compare?

Naturally, the decision between iOS and Android plays a huge role in the decision-making process, and you'll want to weigh the two platforms very carefully. Diehard iOS users, for instance, would likely find it difficult to switch to Google's mobile OS because they'd have a



lower number of dedicated tablet apps to choose from; heck, most Android smartphone users probably have the same complaint. This is a problem the iPad mini simply doesn't have, which may inherently give Apple a leg up, higher prices or not; it also gets brownie points for having a better battery.

Looking strictly from a budget and spec standpoint, however, the \$229 Nexus 7 offers an insane amount of value that bests the iPad mini. The

display is the best we've seen on a small tablet, the stereo speakers offer amazingly loud audio, the performance stands up to gaming and other intensive tasks, and you get NFC, wireless charging and enough cellular radios to make it compatible with three of the big four US carriers. If ecosystem doesn't play a large factor in your decision, we heartily recommend the new Nexus 7.

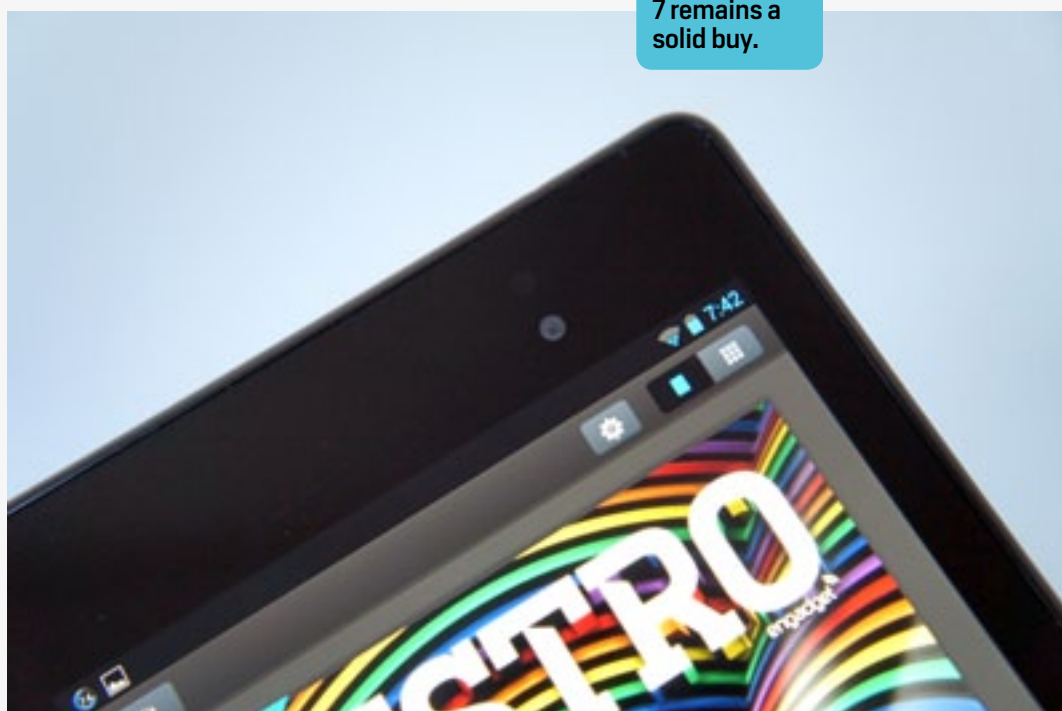
The new Nexus 7's battery life falls short of the old one.



WRAP-UP

When the first Nexus 7 came out, we applauded Google's willingness to sell it for less than \$199. Even though the new version is an extra \$30, we can confidently say it offers the best bang for your buck — yes, that includes the iPad mini, though Apple's entry in the small tablet category has a much more diverse catalog

Even with a price bump, the Nexus 7 remains a solid buy.



of tablet-specific apps. Granted, Android is slowly but surely improving its selection, but it still has a long way to go before it catches up. That frustration aside, the new Nexus has a lot to offer, including an incredible display and strong overall performance. As long as you don't mind the selection of tablet-optimized apps in the Play Store, you'd have to be an extreme power user to

not enjoy the latest Nexus 7, and you'd most definitely be paying through the nose to land anything better. **D**

Edgar Alvarez contributed to this review.

Brad is a mobile editor at Engadget, an outdoorsy guy, and a lover of eccentric New Wave and electro. Singer and beatboxer.

BOTTOMLINE

GOOGLE NEXUS 7 (2013)

\$229+



PROS

- Beautiful 1080p display
- Improved performance
- Incredibly loud sound
- Wireless charging

CONS

- Weirdly proportioned bezels
- Battery life not as long as the original Nexus 7's

BOTTOMLINE

The Nexus 7 is definitely the best bang for your buck, and is still affordable enough for most budget-savvy shoppers.



DISTRO
08.02.13

REVIEW

NVIDIA SHIELD



The hand-held **NVIDIA Shield** packs Android and PC gaming chops inside the company's first hardware effort
By Ben Gilbert

NVIDIA Shield is a truly strange device. It combines an eight-button, console-size gamepad with dual analog sticks and a 5-inch “multi-touch, retinal” screen. It runs stock Android 4.2.1. It touts wireless PC game streaming as its main selling point. It plays Android games; it plays PC games; *it does the Twitter and the Gmail; et cetera*. With Shield, NVIDIA is aiming to be the Swiss Army Knife of hand-held game consoles. It slices! It dices! ShamWOW!

It also costs \$300, weighs nearly 1.5 pounds and takes up quite a bit of bag space. Its main



selling point — PC game streaming — is dependent on the user already owning a PC with a relatively fancy (\$140) NVIDIA GeForce GTX 650 GPU or better. Let's be honest, though: you already know this stuff, right? If you're reading this review, you either already own all the necessary gear and wanna know if this is a worthwhile peripheral for your PC, or you're morbidly curious about NVIDIA's (admittedly bizarre) console experiment. Let's all head into the review and try to find satisfaction.

HARDWARE

Build quality: Not since the days of Atari's Lynx and Sega's Game Gear has it taken so much strength to play a hand-held gaming system. At just over 1.25 pounds, the Shield is double the weight of its closest competitor, Sony's PlayStation Vita. For the past few weeks, it's been the second-heaviest thing in my reporting bag, which includes a Sony NEX-C3 and a MacBook Air (the heaviest item). The Shield isn't so heavy that I experienced fatigue while playing, but it's much more suited to couch use than subway use. Like the Wii U gamepad, the Shield is far more comfy as a lap-based device than one held

in the air. Simply put, it's too bulky for mobile use.

In fact, the Shield is about as bulky as hand-held gaming consoles of yore. Its rubberized outside — while appreciated during long gaming sessions — doesn't make it any easier to conveniently slip it into a bag while on the go. Should you choose to purchase a carrying case for your Shield, it'll only make the handheld more cumbersome.

The device's size is the first of several major barriers that get in the way of it being a truly "mobile" console. Thankfully, what NVIDIA Shield lacks in portability, it makes up for in utility. The Shield's weight and bulk are a tremendous boon when using it for media viewing. The solid hinge between the HD screen and gamepad below enables a variety of viewing angles for lazily

watching old episodes of *The West Wing*, and the rubberized bottom keeps

Stock Android sorts the gaming wares and other apps.



it from rattling when Jed Bartlet starts yelling (the two speakers in the gamepad are *mighty* loud — more on that in a minute). That same benefit applies when you use this thing as an Android device: the sturdy, heavy gamepad acts as a foundation for the top display, so that it doesn't move around when you're sticking your hands all over the touchscreen.

In short: yes, the Shield is big. And yes, it's bulky. And no, it's not really a portable device. And that's all totally OK.

Display: Crisp, large, bright and easy to use — there's not much else to say about the Shield's "retinal" 5-inch (1,280 x 720) IPS screen. PC games

look great on it, as do high-def video and Android games. Even Tommy Veretti's polygonal mug looks great on it. Better yet, the IPS screen looks great from various angles, and stands up to the sun's radioactive rays with aplomb. More importantly, as we said, it's affixed to a strong plastic shell with a massive hinge. As a result, the screen can be bent to any degree you fancy and remains in position.

This seemed a minor consideration at first, but has implications for both media viewing and using Shield as a music player. As a media-viewing device, it's a delight to have access to a wide range of view-

ing angles, and the screen is sharp enough that it's easily

The 5-inch display handles both games and media well.



watched from several feet away. As a music player, sharply angling the screen offers amplification to the Shield's already loud stereo speakers. How loud are those speakers, by the way? They're delightfully loud, to the point that sound will shake the entire device during particularly raucous moments. Used with Spotify or other music solutions, Shield makes for a mean little portable music box.

Gamepad: Just below those speakers is the rectangular gamepad: the star of the Shield show. It's... *acceptable*. For our money, the Xbox 360 wired gamepad is the go-to option for PC gaming. Shield offers an adequate facsimile — button placement is near identical, the only exception being parallel concave thumbsticks (like Sony's DualShock) — but nothing

beats the real thing. The four A / B / X / Y face buttons exist on a flat plane, while the 360's are on a slightly curved surface. The Shield's parallel thumbsticks are deeply recessed due to the attached screen — a dramatic difference. The shoulder buttons aren't clicky on the Shield, and its triggers have extremely strong resistance.

None of which is to say the Shield is poor as a gamepad; it's just not as solid as the consumer standard for PC gamepads.

There are other issues with control, specifically regarding the thumbsticks. Due to their depth, aiming and controlling the camera in first-person shooters sometimes feels loose. Since thumbsticks are normally above where thumbs rest on a controller, resistance is provided between stick and thumb. When reaching into the Shield to push the thumbsticks,

The gamepad houses speakers, thumbsticks and more.



resistance is hard to come by. I also have little baby thumbs, so your experience will vary in this respect. As for the D-pad, it's the closest Shield gets to replicating the 360 gamepad. In fact, Shield's is clickier, quicker and more comfortable than its terrible inspiration.

PERFORMANCE AND BATTERY LIFE

True to NVIDIA's claims, our Shield review unit's 28.8Wh battery lasted through about 10 hours of near-constant use — from streaming video and games to media played directly from the device, all while connected to WiFi and regularly checking our (*very important*) Twitter account. The Shield's battery lasts far longer when we stick with PC / media streaming and don't crank the screen's brightness up all the way, though never beyond a day and a half. Charging's handled through the micro-USB port around back. Going back up to a full charge from a sub-10 percent battery rating takes three to five hours, which we're

With 10 hours of battery life, the Shield almost runs all day.



calling too long.

Unsurprisingly, the number one battery drain (by a long shot) is the massive screen. Tegra 4-enhanced games can also be taxing on the system's battery life, but we can't see ourselves playing any of the games available for longer than a few hours (more on that in the software section).

The Shield looks like a game controller with a 5-inch screen attached (and it is that, of course), but it's actually a great alternative to tablets too. As a media device, it's top-notch. The delight and convenience of adjustable, locked viewing angles for the screen cannot be oversold; gone are the days of desperately trying to balance your tablet while lying about.

It's also a damn fast Android device. Apps and games load as quickly or better than flagship smartphones and tablets, and, as you'll see, Shield has zero issues with multitasking. Used in tandem with those loud stereo speakers, we found ourselves comfortably employing the Shield

like a portable DVD player from the early oughts, streaming *The Daily Show* via Hulu+ instead of watching old *Friends* DVDs.

In many cases, the Shield allows for gamepad input in place of touch. And with something like Hulu or Netflix,



gamepad control makes some sense, allowing control without blocking what you're watching. When it comes to text entry, however, that's a whole other story. We used the gamepad for text entry almost never, instead opting for the infinitely faster touch nav. Jumping between the two input methods becomes second nature, especially given how much faster functions like text entry are with the touchscreen. It's pretty cumbersome to hold the Shield's screen with two paws *and* enter text, but it's better than the gamepad alternative.

Gaming experience: Shield walks a particularly dangerous line, trying to appeal to both PC gaming enthusiasts and technophiles, two groups known for particularly discerning standards. But despite its Swiss Army Knife-esque capabilities, the Shield doesn't try to be all things to all people. The stock Android Jelly Bean OS doesn't force any gimmicky software, and setting up PC streaming — the marquee software functionality on Shield — is as simple as clicking an "Accept" prompt on your PC a single time. (Note: You'll need the requisite GeForce GTX 650 GPU or higher, the latest Shield firmware update and

the latest version of GeForce Experience running on your PC. The Shield and the PC must be on the same network for streaming to work.)

Switching from app to Android game to PC streaming to email happens impressively quickly, with more time allotted for network connection issues than processing. The Tegra 4 SoC laughs at multitasking; we only heard the internal fans kick in once during several weeks of use.

The dedicated TegraZone button in the middle of the gamepad works great alongside the TegraZone custom app NVIDIA loads on Shield. A tap from anywhere and you're able to quickly access all your Android games, various PC games and Steam's Big Picture mode. If it's held down, a menu offers a handful of system options, which includes shutting off the Shield. The hardware / software tie-in for easy game access and

There's no gimmicky software auto-loaded on Shield.



shut down options makes the Shield feel like a little game console, and the game streaming solidifies that emotion.

PC titles: Game streaming is not perfect on the Shield. It's not as good as the Wii U's gamepad, and it's not as good as playing games directly on a PC. It occasionally hitches, or encounters "network interference," or crashes. (It is in beta, after all.) And there's some lag. Like the gamepad itself, Shield's PC game streaming functionality is *acceptable*. Unlike the gamepad, though, Shield's PC game streaming feels kind of *magical*.

BioShock Infinite played on a 5-inch hand-held screen is, if nothing else, very impressive. Combat is slow enough that any input lag issues are relatively non-existent, and the lush artistry of Columbia's floating world is all the more vibrant when shrunk down. Similarly, *Need for Speed: Most Wanted* runs beautifully. Think of it this way: any game that doesn't require twitch reactions works well on Shield. Our attempts at *Call of Duty: Black Ops 2* were fruitless. *Team Fortress 2*, however, was perfectly fine. And to Shield's credit, that connection holds strong farther than Nintendo's Wii U gamepad. That distance comes with a



heavy helping of artifacting and the occasional loss of sound, but it remains playable.

Shield likely won't replace your PC gaming setup of choice, but it is a great addition. The controller isn't as good as other options, and the lag is a dealbreaker for many folks, but the experience of comfortably playing high-end PC games on a handheld is truly special.

Android games: Ahead of this review, NVIDIA sent over a list of games that are either "Tegra enhanced" and / or that have "controller support and play well" on Shield. Of the lengthy list of games, we tried approximately two dozen titles, including heavy-hitters like *Grand Theft Auto: Vice City* and (dare we make the pun?) *Real Boxing*. Whether or not those games were any good is a question for another review — the issue we saw repeatedly with Android gaming on the



Shield is inconsistency.

Despite being both a “Tegra-enhanced” game and promoted in the official Shield-branded store, *ARMA Tactics* can’t handle all the button inputs being thrust at it. In its current state, it’s completely unplayable on Shield using gamepad input. *Beach Buggy Blitz*, however, works without a hitch. The pause button pauses the game and the command prompts on-screen during the tutorial actually correspond with buttons that exist on the gamepad (unlike *Grand Theft Auto*, which can be a maddening guessing metagame). That last statement sounds weird, we know, but it’s representative of the state of Android games played with the Shield’s gamepad (or any Android gamepad, really).

From game to game, it’s a question of figuring out which previously virtual buttons correspond to which part of the physi-

cal gamepad; none of these games are built with controller support in mind, and its addition feels shoehorned in nearly every instance. Even mobile versions of previously console-exclusive games (*GTA*, *Max Payne*) don’t work as they should, having been ported from consoles to mobile, and then to mobile with console controls.

There’s been a lot of dust kicked up over Android gaming in the last year, between the OUYA, Shield, GameStick and what have you. Unfortunately, it’s just that: a cloud of dust. Android gaming is making its first baby steps toward validity, but it’s still got a long way to go. In the meantime, the PlayStation Vita’s and Nintendo 3DS’ game libraries trounce the inconsistent, often poor-quality titles found in the Play Store.

THE COMPETITION

Let’s not kid ourselves: there’s one

major competitor against the Shield. It’s \$50 less, similarly powerful and has a much, much better selection of mobile games. Sony’s PlayStation Vita isn’t a great multimedia device, but it is a *very* good gaming device. If you’re stacking up the Shield against the Vita in the “portable gaming” cat-

Discovering controls from game to game is an adventure.

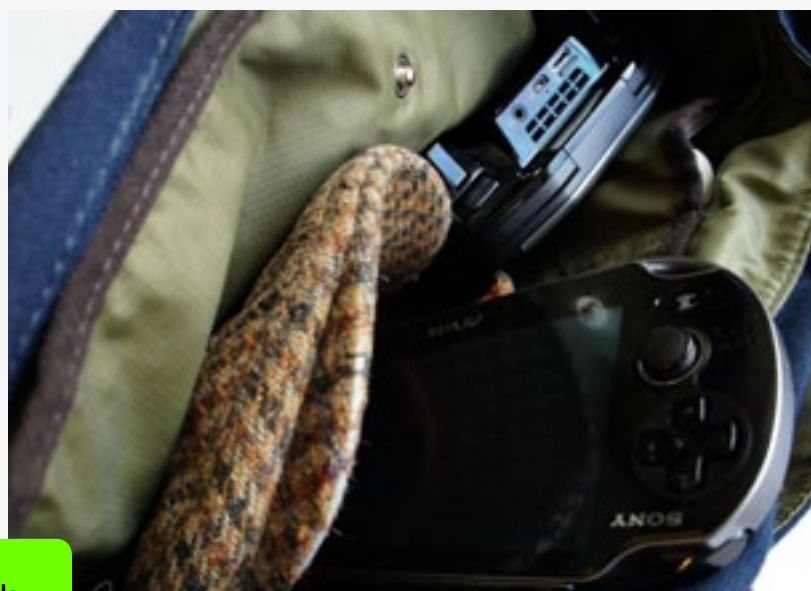


egory, it's a no-brainer win for the Vita, a handheld that weighs half the Shield, has a larger, prettier screen and is far more "mobile." The Vita can be easily slipped in a bag. The Shield cannot.

If you're stacking up the Shield against the Vita as a game console, however, the Shield makes a much stronger argument. Not only does it stream your PC games (at least the controller-based ones), but it's a comfortable way to stream movies in bed. It's a great portable music box. It's perfect for looking at a recipe while cooking. The Shield is an excellent tablet replacement, essentially, while the Vita is a great gaming device and little else.

WRAP-UP

At \$300, NVIDIA Shield is a hard sell as a portable game console, but an easy sell in place of a similarly priced tablet. Sure, it doesn't have a cam-



Existing handhelds are much more "mobile."

era, but it does offer extremely impressive PC streaming, along with wide viewing angles. The Shield remains a "truly strange device," but it's one that we feel comfortable recommending to hardcore PC gamers and Netflix junkies alike. **D**

Ben Gilbert is a Senior Associate Editor at Engadget, where he tends to write about video games. He loves a great breakfast, is obsessed with media, and recklessly employs serial commas.

BOTTOMLINE

NVIDIA SHIELD

\$300



PROS

- Fast and powerful
- Gorgeous screen
- Excellent media player
- Impressive battery life

CONS

- Heavy, not very portable
- Gamepad needs work, thumbsticks too low

BOTTOMLINE

The Shield is a pleasant surprise and quite an impressive device. It's not the portable console you're looking for, but it's also so much more than that.



GOOGLE CHROMECAST



Google rejoins the streaming game with its \$35 **Chromecast** dongle, looking to smarten up your dumb TV at a very approachable price
By Michael Gorman

Despite the best efforts of Panasonic, Samsung, Sony, LG and others, most of the televisions in people's homes these days are not of the smart variety. However, there are hundreds of millions of regular televisions packing HDMI ports, and Google's new Chromecast device offers a way to put some brains into those dumb TVs by giving them access to web-based content. Having a Chromecast dongle connected to your TV means you can stream videos straight from a Google Play, Netflix or YouTube app, or mirror the content in any open tab in Google's Chrome



browser using a tab casting feature.

Sure, we've seen devices with almost identical functionality, like Plair, but Chromecast is backed by Google, whose relationships with content providers and developers mean that the Google Cast technology powering it will soon be popping up in even more apps. Not to mention, there's the price. At \$35, it's almost a third of the cost of Plair and also Roku 3 and Apple TV, the current most popular devices that bring internet video to your TV. Even for such a paltry outlay, is it a worthy addition to your living room? And is it really "the easiest way to enjoy online video and music on your TV" as Google's marketing would have us believe? Read on to find out.

HARDWARE AND SETUP

Inside the Chromecast's packaging, you'll find a dongle, an HDMI extender, micro-USB cable and an electrical plug adapter. The dongle itself measures 70mm long and 12mm thick, and is 35mm wide at its most bulbous point. Beveled matte black plastic panels on the top and bottom sides are joined by a band of glossy polycarbonate ringing the edge. Inside that plastic exterior lies a Marvell SoC, a combination Bluetooth/FM/802.11 b/g/n WiFi radio, 2GB

of storage and 512MB of SDRAM. Up top, there's silver Chrome branding and a single LED power indicator. If you're curious, the requisite model numbers and FCC info can be found on the bottom. Not much to it, folks.

Instructions on how to hook it up are printed on the packaging itself, and they're about as straightforward as you'd expect. Just plug the USB cable into the rounded end, and stick the other in one of your TV's HDMI ports. Then you either connect the cable to one of your TV's USB ports or plug it into the power adapter to give it the juice it needs. Once you're plugged in and have navigated to the appropriate TV input, the device brings up a setup webpage on your computer, prompting you to connect it to your home's 2.4GHz wireless network and install the Google Cast extension to make your Chrome

browser compatible. Once that's accomplished, you're

Google's
pint-sized
retrofit kit for
smartening
dumb TVs.



ready to start streaming content from the cloud to your newly empowered TV set. Easy, right?

USER EXPERIENCE: NATIVE APPS

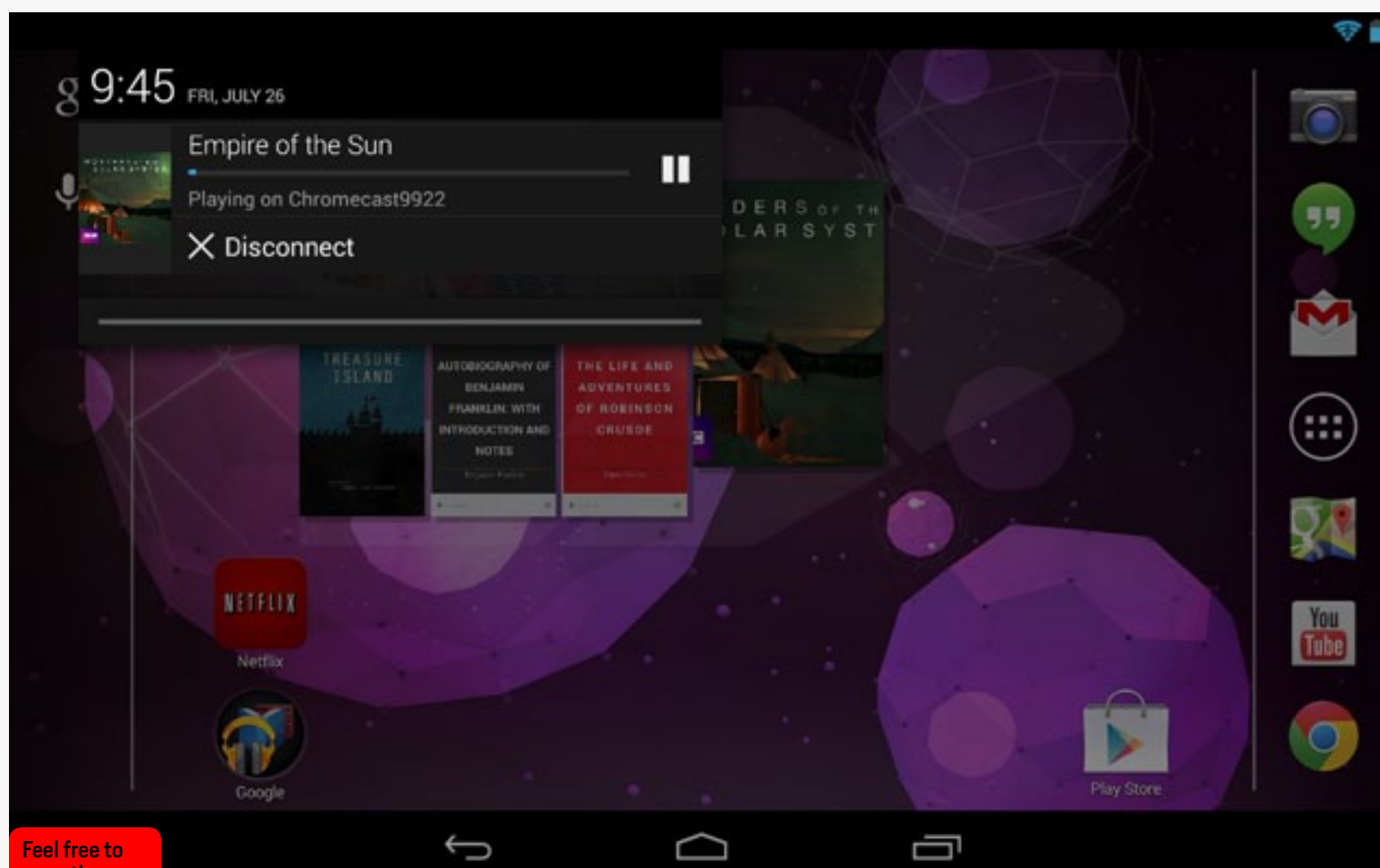
Once you get rolling, you'll find that simplicity extends into Chromecast's native app interface as well. Google's released an SDK for the underlying Google Cast technology that makes Chromecast work, allowing developers to easily add that capability to their own apps. For now, though, just three applications — YouTube, Netflix and Google Play Movies — make use of the technology. The process of slinging content to the TV is the same across the board: open the video of your choosing, then tap the Chromecast icon and within a couple seconds that video will load up

on the big screen. Once one video is playing, you're free to search for your next video, use other apps or put your mobile device in standby mode.

Speaking of which, you can use Chromecast on both the iOS and Android apps for YouTube and Netflix, and the service generally worked well whether we were using a Galaxy Nexus, Nexus 7 or fifth-generation iPod touch. Videos played with just a little bit of artifacting as the dongle buffered the content, but the streaming quality was otherwise excellent. Because Chromecast is a feature within existing apps, calling up content works as it always has within those respective applications. Also worth noting: the YouTube app allows you

Three apps work with Chromecast now, Netflix included.





Feel free to use other apps while the content is streaming.

to add videos to a playlist and have them (mostly) stream in seamless succession. The only hiccup we found with the “add to TV queue” feature made itself known when we added a video to the playlist from a new device. This caused the then-playing video to stop and switch to the video chosen on the new device. However, after that device’s initial cast, adding videos to the list from any device can be done without interruption.

There were some glitches with the other two apps as well. Google Play Movies froze while loading up one video, but we were able to remedy the issue by closing the app and trying again. The Netflix app also quit registering touch input during playback on

several occasions when we allowed our device to enter standby mode. Granted, it didn’t affect streaming on the television, but we had to force-close the app and restart it to regain the ability to control playback or choose a new movie within the app.

Those isolated inconveniences aside, Chromecast works well. We found ourselves switching sources of content with ease, jumping from Play Movies, to Netflix, to YouTube and back without issue. There is, of course, a few-second pause when jumping from app to app, but such delays are part and parcel of any video streaming service. Plus, as anyone with DirecTV knows — this editor included — mainstream satellite television isn’t always the swiftest at changing gears,



either. Finally, to close this section out, we also had no problems when switching sources from the apps to the Chrome browser on our laptop.

USER EXPERIENCE: CHROME BROWSER

As with the mobile apps, broadcasting video from a Chrome tab is as simple as tapping the Google Cast icon that shows up in the menu bar once you've installed the Google Cast extension. However, browser tab casting is different from the app implementation. Casting from the browser simply mirrors what's in a given tab; it doesn't stream video independently as it does within the apps. (This is the major difference between Chromecast and Plair, which can stream video independently from the browser.) A quick note: you *can* stream videos from YouTube on your laptop independently if you use the casting function built into the YouTube web player, but not if you use the Google cast extension in the browser itself. Netflix broadcasting from a browser won't be an option until the company makes the switch to HTML5, because Chromecast doesn't support the Silverlight technology currently powering Netflix.com.

Despite this being beta software, tabs and videos opened, maximized and cast at both default and high-bitrate 720p settings played as fluidly on the TV as they did on our test laptop (a 2011 MacBook Pro, in this case). While others have experienced audio sync issues, we've had

none in our time with the device thus far. When we attempted to mirror a tab on our Cr-48 running Chrome OS or a Toshiba Portege R705 running Windows 7, however, things weren't so peachy. The minimum hardware requirement for HD playback on a Windows machine is a second-gen Core i5 CPU clocked at 2GHz or higher, while mirroring at 480p requires a Core i3 or equivalent processor. Currently, the Chromebook Pixel is the only laptop running Chrome OS that's officially supported. Still, we wanted to test the service with all of our available machines to see how it performed.

As expected, video from those laptops streamed at the default 720p resolution stuttered badly enough to render it unwatchable. Clips did mirror well from our Windows laptop when the resolution was reduced to the minimum 480p, but the quality was degraded and did not look very good on our 47-inch flat-screen. Streaming YouTube through the Google Cast feature built into the player worked just fine, however. So, if you've got an older machine and are banking on using the tab casting feature extensively, you're likely to be disappointed, barring some changes between now and when the feature exits beta.

One of our astute readers pointed out that local media can be played on Chromecast using the browser tab casting feature. You simply need to type the file's location into Chrome's Address bar. However, this only works with media using



certain codecs, and right now the Google Cast technology supports a limited number of media types. You can find the full list at the Google Developers website.

Generally, we found the mirroring feature to be quite useful, mostly because it let us stream from Rhapsody, Showtime Anytime, HBOGo, Hulu, Vimeo and other online media sources that don't directly support the Google Cast standard. Using the Chrome extension is dead simple, and for the most part, it works really well. Plus, it serves as a great stop-gap solution to give folks access to the majority of content on the web — while giving Google time to evangelize the platform and increase adoption of its Google Cast SDK in other content makers' apps and players, where the technology provides a much

better user experience. Make no mistake, however: tab casting is not as good a user experience as using mobile apps.

THE COMPETITION

Given the Chromecast's tempting price and mainstream target market, we think it would be most instructive to compare it to its two most popular rivals: Roku and Apple TV. There are five members of the Roku family, with different features and different prices, but the Roku LT, Roku 3 and Streaming Stick are the devices that compete most directly with Chromecast — the LT for its \$50 price, the 3 for its 1080p streaming and full feature set and the Streaming Stick for its 1080p streaming and dongle form factor. However, the

Measuring up
against the
competition,
Chromecast
vs. Roku 3.



LT is still \$15 more than Chromecast and doesn't support 1080p resolution, while the Roku 3 and Streaming Stick each cost \$100. Plus, the Streaming Stick requires you to own or purchase a Roku-ready television, and Rokus are app-dependent for their content. So, if you're a YouTube or Showtime fan, you're out of luck. That said, thanks to MHL support, the Streaming Stick doesn't need a separate power cable like Chromecast does.

Like the Roku 3, Apple TV costs \$100, which makes it considerably more expensive than the Chromecast. Apple TV allows users to mirror content from other devices using AirPlay, which is superior to Chromecast's similar functionality because it's not limited to just browser-based content. Additionally, Apple TV enables direct streaming of music, movies and photos using AirPlay as well.

WRAP-UP

Until now, getting internet content on

a television screen required plunking down a wad of cash for a smart TV or a home theater PC, or spending around \$100 on hardware like a Roku or Apple TV. Chromecast brings the internet to your TV in a form that's easy to use and priced at a fraction of the cost of all those other options. Sure, it's not as fully featured as some of its competitors, but it does provide a *lot* for just \$35, and it's a platform that's likely to improve dramatically as more apps start to support the technology. Were it not so cheap, we might feel differently. But, as it stands, we can wholeheartedly recommend the Chromecast for anyone who's been looking for an easy, unobtrusive way to put some brains into their dumb TV. **D**

Michael Gorman is a Senior Associate Editor at Engadget, attorney, Hokie and 8-bit gaming enthusiast. He likes dogs, too.

BOTTOMLINE

GOOGLE CHROMECAST

\$35



PROS

- Inexpensive
- Simple and easy to set up
- App implementation is slick and easy to use

CONS

- Limited app support for now
- Chrome browser casting is a less-than-ideal UX and requires fairly new computer hardware to stream in HD

BOTTOMLINE

Chromecast is an easy way to stream internet video to your TV from almost any source. With a price of just \$35 it's a bona fide steal.



ESC

DISTRO
08.02.13

VISUALIZED

BROOKHAVEN NATIONAL LAB (PAGES 1-5); FERMILAB (PAGES 6-10)

Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

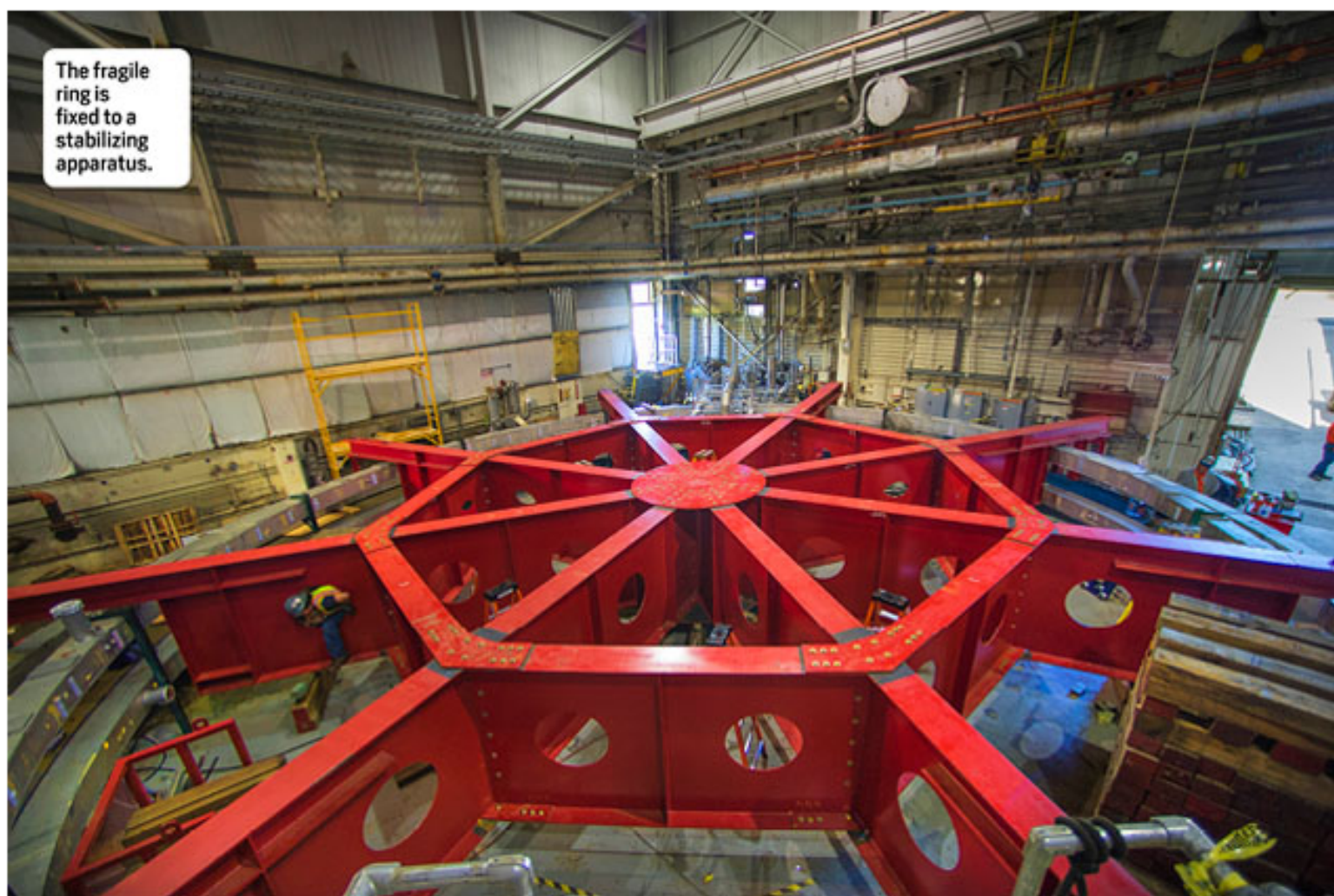
around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — *Jon Turi*



ESC

DISTRO
08.02.13

VISUALIZED



Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



ESC

DISTRO
08.02.13

VISUALIZED



Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi

BROOKHAVEN NATIONAL LAB (PAGES 1-5); FERMILAB (PAGES 6-10)



ESC

DISTRO
08.02.13

VISUALIZED



The Muon g-2 ring begins its long journey to Fermilab.

Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



ESC

DISTRO
08.02.13

VISUALIZED



Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



ESC

DISTRO
08.02.13

VISUALIZED



Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



ESC

DISTRO
08.02.13

VISUALIZED



Workers guide the truck through Illinois roadways.

Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



ESC

DISTRO
08.02.13

VISUALIZED



Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



ESC

DISTRO
08.02.13

VISUALIZED



Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — *Jon Turi*



ESC

DISTRO
08.02.13

VISUALIZED



Swipe
for
more

Muon g-2 Makes a Move

Since the '90s, Brookhaven National Lab in NY has been home to a 50-foot electromagnetic ring used for experiments with extremely short-lived subatomic particles called muons (a lifetime in 2.2 millionths of a second). On July 26th, however, the ring ended a 3,200-mile-long journey to its new home at Fermilab in Illinois, where scientists from

around the globe plan to run a similar experiment called Muon g-2 (pronounced gee-minus-two). The extremely large and fragile ring was secured in a metal frame and had to travel by water down the East Coast, around Florida, up a series of rivers to Illinois and was then finally delivered by truck to Fermilab and a welcoming crowd. — Jon Turi



JULIE UHRMAN



Which do you look back upon most fondly?
Motorola StarTAC — was my first phone. Huge battery, three saved numbers. I still have it.

Which company does the most to push the industry?
Apple. They taught us to think different.

What is your operating system of choice?
Obviously, I should say Android, but truth be told I also love iTunes... and I have too much invested on kids' shows to get away from it now!

THE FOUNDER AND CEO OF OUYA on click reduction and quantifying inactivity

What gadget do you depend on most?
Cellphone, but I don't consider it a gadget — it's a necessity, like air and water!

What are your favorite gadget names?
Love the Flip camera. Lytro, Nest, both super descriptive, but of course my favorite is OUYA.

What are your least favorite?
Names I can't pronounce or spell.





Jawbone's Up wristband and mobile app help users track their activity, sleep cycle and diet.

Which app do you depend on most?

Email, but I don't think that really counts. Next is my Up by Jawbone. I like seeing how little I sleep and work out.

What traits do you most deplore in a smartphone?

That I have to click into an app to get information. I think we could be smarter about push notifications and "widgets."

Which do you most admire?

Simplicity and user intuitiveness.

What is your idea of the perfect device?

Beautiful, powerful, impactful, simple and with long battery life.

What is your earliest gadget memory?

Hand-held gaming device playing *Donkey Kong*.

What technological advancement do you most admire?

Open-source. Puts the ability to change the world into every-

one's hands.

Which do you most despise?

Any closed platform or system. Pay-to-play-type thing.

What fault are you most tolerant of in a gadget?

Battery life.

Which are you most intolerant of?

Those that are difficult to use and / or don't add a lot of value.

When has your smartphone been of the most help?

Staying connected while traveling... email, calendar, map... *and* games.

If you could change one thing about your phone what would it be?

Pulling info out of apps — no clicks.


What does being connected mean to you?

Accessibility.

When are you least likely to reply to an email?

Never, I'm way too responsive — so, when I'm sleeping.

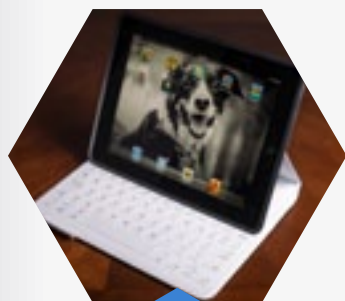
When did you last disconnect?

I disconnect every day from 5-8:30 PM to make time for my family. 



IN REAL LIFE is an ongoing feature where we talk about the gadgets, apps and toys we're using in real life.

TYLT ENERGI CHARGING BACKPACK



Logitech
FabricSkin
Keyboard
Folio

WE HAD A CHANCE to check out the Energi backpack back at CES, and at long last, it's shipping to consumers. I've spent the last couple of weeks attempting to fit it into my daily life, and I've found quite a few things that I dig. For one, it's super comfortable. The straps boast a wildly padded shoulder brace; it looks a little weird, but I've found myself longing for something similar on every other pack. Then there's

the flexibility. The company was wise enough to not permanently install the 10,400mAh battery pack, so when you're using it sans gadgetry, you don't have to lug around extra weight.

The cell is capable of charging a trio of USB-based

devices (tablets, phones, mobile hotspots, etc.), but not a laptop. As a self-proclaimed HyperMac fanatic, I definitely found myself longing for laptop-charging capabilities, as outlandish as that may sound. It's also worth noting that this pack is on the small side. Of course, I'm the type of guy who doesn't accept anything much smaller than a Mountain Hardware Agama (which is crazy spacious, for those unaware), but I'm also the kind of guy who needs as much backpack space as possible in order to prevent the need for checked luggage.

Perhaps the biggest drawback is the price. At \$200, it's hardly a *bad* deal — after all, the Agama will run close to \$100, and a 7,200mAh HyperJuice will set you back another Benjamin — but unless the size is ideal for you, you'll probably find yourself starved for space. In general, I appreciate what's on offer here, but I'd be way more likely to wholeheartedly recommend it if a larger version were made available at a similar price. — *Darren Murph*



LOGITECH FABRICSKIN KEYBOARD FOLIO



TYLT
Energi
Charging
Backpack

SURFACE-LIKE. There, I said it. There's really no avoiding a comparison between Logitech's new FabricSkin line of keyboard covers and Microsoft's Touch Cover add-on. Both do double-duty as tablet protectors and ultrathin QWERTY keyboards. Also like the Surface, the Logitech FabricSkin

Keyboard Folio props its host tablet (a second-gen or newer iPad) on a kickstand-like support at a roughly 22-degree tilt.

There are certainly unique traits here, like the fact the FabricSkin envelops an iPad, rather than attaching to one side. Cutouts in the rubbery frame allow access to the



camera, speaker grille and all the usual ports, including the 30-pin connection on older iPads. A micro-USB charging port is embedded on the right side of the base. In the landscape-only productivity mode, a magnetic connector grabs hold of the iPad and plunks it down right above the keyboard. Once that hookup is made, the keyboard powers up and attempts a Bluetooth sync. Setup occurs without much fuss and you should be pecking those full-size keys in short order.



The FabricSkin one-ups the Touch Cover by adding a bit of travel to its keys, thanks to what feels like a membrane-based keyboard hiding just below the slightly rubbery, water-resistant surface. That subtle feedback makes touch typing a surprisingly pleasant experience. And yes, that water-resistance claim holds up.

Naturally, there are some drawbacks. In order to fit full-sized keys on an iPad frame, Logitech had to assign multiple functions in places. Notably, the Q and A keys double as the Tab and Caps Lock functions, respectively, when you hold down the Fn button. The extra-wide A key (sized like a typical Caps Lock button) takes quite a bit of getting used to. There's also the question of software compatibility. Pecking out messages in the Notes and Facebook apps is fairly intuitive. Typing docs in Google Drive (which is how I wrote this IRL) works as expected, too. However, the arrow keys don't function when working on spreadsheets in Google Docs, making navigation a bit of a hassle.

Overall, the Logitech FabricSkin Keyboard Folio seems a solid choice for those looking for both protection and increased productivity with their iPad. At \$150, it's worth trying out first to see if you can overcome the slightly odd layout. — *Philip Palermo*



The week that was in 140 characters or less

Air Streaming, Clicker Finding and Warm Fuzzing

DISTRO
08.02.13

ESC

REHASHED

@nicole

I've been playing around with Chromecasting from my Air, and let's just say the fans are on full blast right now.

@snipeyhead

GPS for my
luggage? I'd
take GPS
for my TV
remote first.

@seanhn

Hmm, so apparently
my central heating has
died. I am currently
fuzzing for warmth
rather than out of a
need for bugs =/

@richardlai

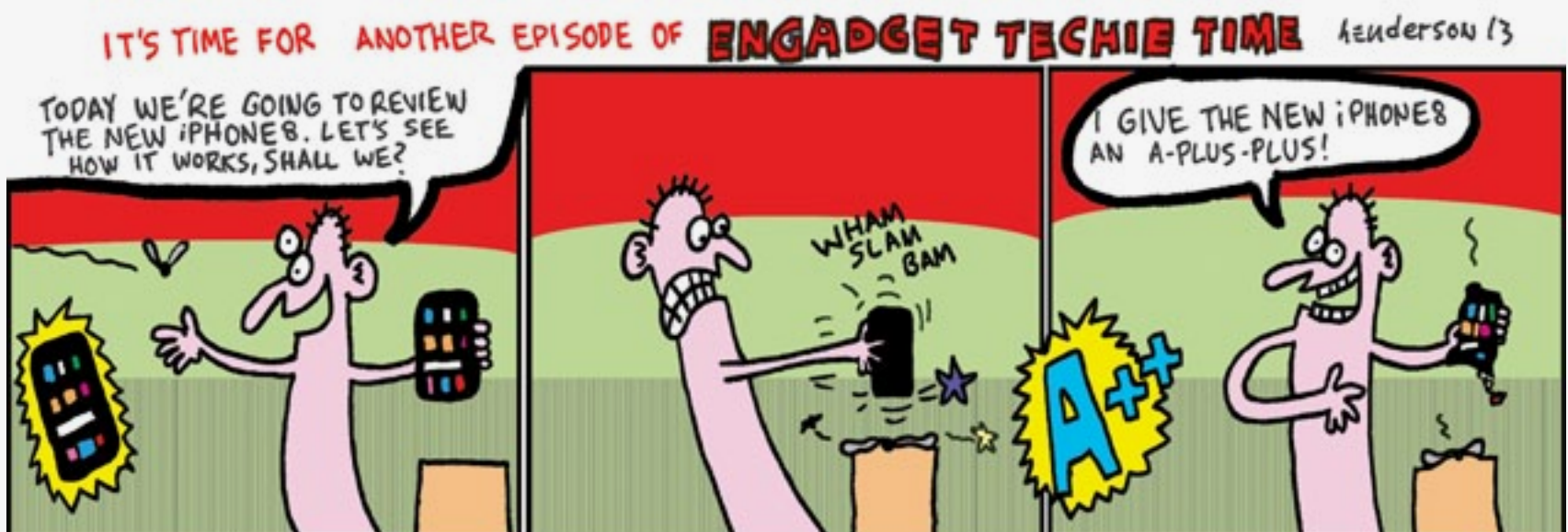
It looks like the Moto X is HTC e1 done right. It could become the Nike of phones. We shall see.

@harrymccracken

In other news, Rdio keeps telling me I need to be online to listen to my offline music.

THE STRIP

BY SAM HENDERSON



DISTRO
08.02.13

ESC

TIME
MACHINES



WHAT IS THIS?
TOUCH TO FIND OUT



SHORPY



DISTRO
08.02.13

ESC

TIME MACHINES

MODERN EQUIVALENT:

iRobot Scooba / Roomba



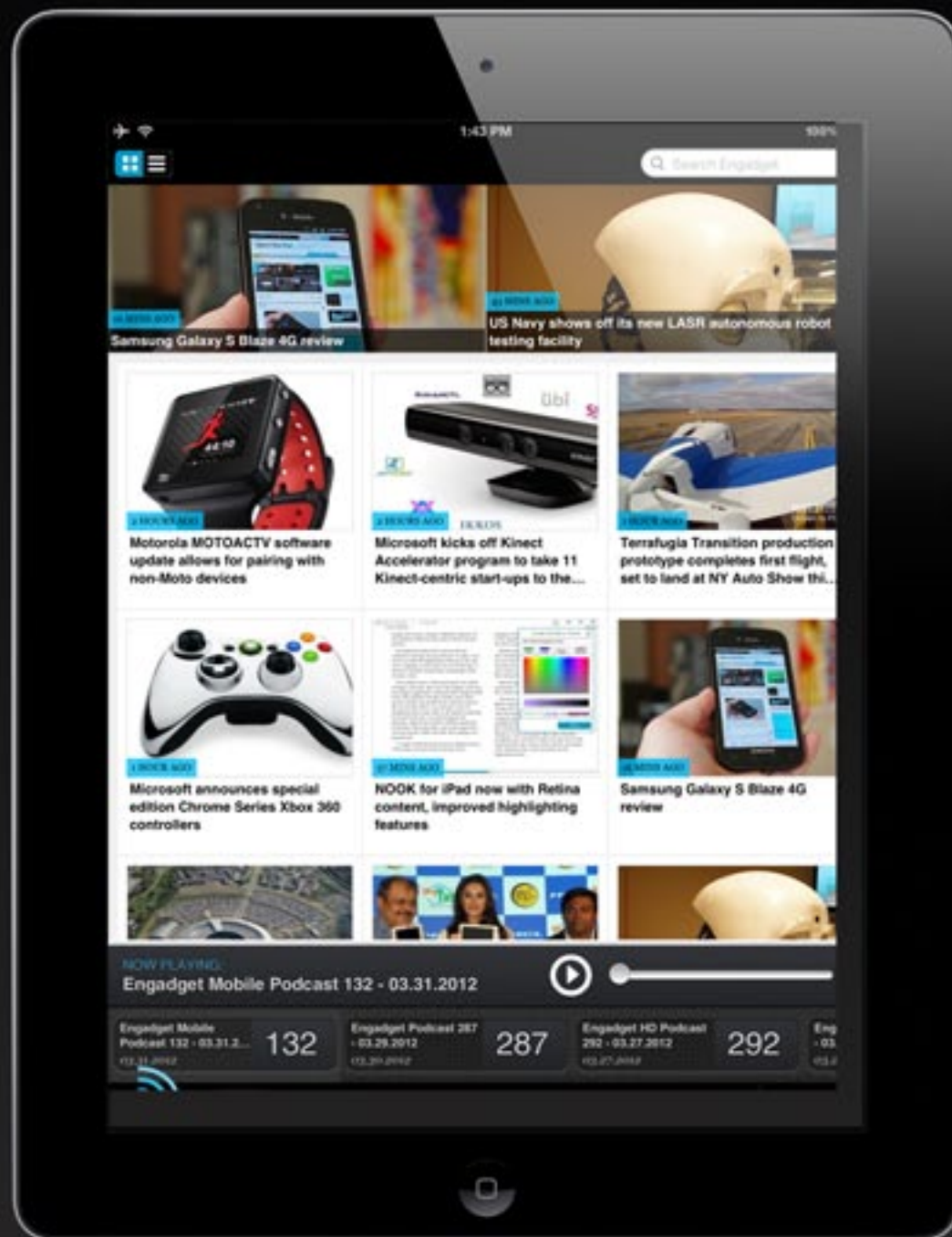
Controlling kitchen appliances and monitoring an entire home from one electronic panel? OK, in the age of the connected home it's not that far-fetched, but in 1957 it was just short of a miracle. Indeed, "RCA-Whirlpool's Miracle Kitchen" marketing campaign was all about the possibilities of the ultra-modern home, and with the post-war economic boom in full swing across America, homemakers were clamoring to see what time-saving devices were in store. Among the forward-thinking concepts were hands-free controls, remote camera monitors and a robotic floor cleaner, which busied itself with keeping the kitchen floor sparkling clean.

MIRACLE KITCHEN



engadget

The real-time source and final word for news on gadgets and technology.



Now available for your Tablet.



Brought to You by AOL
Free Download in the App Store

Available on the
App Store

ANDROID APP ON
Google play



Executive Editor Marc Perton

Executive Editor, Distro Christopher Trout
Associate Editors, Distro Billy Steele, Jon Turi
Editorial Interns, Distro Landon Peck, Daniel Stegemiller
Editor-at-Large Darren Murph
Managing Editor Dana Wollman
Director of Media Brian Heater
Senior Associate Editors Don Melanson, Zach Honig, Richard Lai, Michael Gorman, Terrence O'Brien, Joseph Volpe, Ben Gilbert, Sarah Silbert
Associate Editors Joe Pollicino, Sean Buckley, Jon Fingas, Nicole Lee, Edgar Alvarez
Senior Mobile Editors Myriam Joire, Brad Molen
Associate Mobile Editors Sean Cooper, Zachary Lutz
Senior HD Editor Richard Lawler
Associate HD Editor Ben Drawbaugh
Associate Reviews Editor Melissa Grey
Contributing Editors Alexis Santos, Steve Dent, Jamie Rigg, Jason Hidalgo, Kevin Wong
Senior European Editor Sharif Sakr
Associate European Editors Mat Smith, James Trew, Daniel Cooper
Copy Editors Philip Palermo, Samuel Smith
Senior Columnists Joshua Fruhlinger, Ross Rubin, Brad Hill
Cartoonist Sam Henderson

AOL MAGCORE

Head of Ux and Design Jeremy LaCroix
Art Director Greg Grabowy
Designers Troy Dunham, Eve Binder, Susana Soares
Design Production Manager Peter Niceberg
Photographer Will Lipman

Product Manager Gabriel Giordani
Architect Scott Tury
Developers Mike Levine, Sudheer Agrawal

QA Joyce Wang, Amy Golliver

Sales Mandar Shinde

AOL, INC.

Chairman & CEO Tim Armstrong